

FLIGHT

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Founder and Editor: STANLEY SPOONER.

A Journal devoted to the Interests, Practice, and Progress of Aerial Locomotion and Transport.

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EDITORIAL COMMENT.

The Wright Patents in America.

For some time it has been common knowledge in aviation circles in this country that the decisions of the United States Courts in the matter of the Wright patents were having a very adverse effect on the development of the American industry. Just how deeply that effect was being felt was not clear, though in the light of the information conveyed in a communication from an American contributor in Boston to FLIGHT, it would seem that if the Wright Co. persist in their present policy they will succeed, not in making money for themselves, but in wrecking the whole industry. Fortunately for the British industry, there is no threat of any such monopoly as that possessed in America by the Wright Co., for whatever may be the case in other directions, our own patent laws compare favourably in these matters with those of other countries. Leaving aside all these questions, however, it is something upon which to plume ourselves that the only machine which appears to hold out any promise of avoiding the Wright monopoly is one of British design, the Dunne. Even that appears a little doubtful, according to our contributor. However, we will let the latter speak for himself through the medium of his article, which is as follows:—

Boston, Mass., April 1st.

A very interesting situation, from the English point of view, has arisen in America over the Wright aeroplane patents. In January, the Federal Circuit Court of Appeals rendered a judgment for the Wrights which is considered as final, affirming as it does the decision of the lower court. The opinion of the lower tribunal was sweeping in its scope, and gives exclusive control of the aviation industry as it exists in this country to-day to the Wright Co. Following the lower court's decision, Mr. Orville Wright has come out with a momentous announcement which from its terms virtually prohibits the manufacture of aeroplanes by any other concern than the Wright Co., whose plant is situated at Dayton, Ohio. The force of this prohibition lies in Mr. Wright's demand for a royalty of 20 per cent. on the retail price of each machine complete, including motor and equipment. On an aeroplane sold for \$5,000, therefore, the royalty would be \$1,000, and on an aeroplane worth \$10,000 the licence fee would be \$2,000. Furthermore, not only must such royalties be paid on all future machines, but before the Wright Co. will license any constructor now in business, royalties on an equal percentage must be paid on every machine produced in the past. In the case of Mr. Glenn Curtiss, for instance, against whom the judgment was rendered, the back royalties would reach a total of nearly \$50,000, and their payment, under the present precarious conditions existing in the American industry, would be an absolute impossibility.

It will be seen then that the Wrights hold a complete monopoly over aeroplane production in America, so far as the machines now in use are concerned, and propose to exercise this monopoly to the extent of driving every competitor out of business. This has already happened in the case of Mr. Curtiss, who is soon to transfer the seat of his factory at Hammondsport, N.Y., to Europe, where his hydro-aeroplanes and flying boats have met with an excellent reception.

Mr. Wright defended his course of action by denying that his prohibitory attitude would hamper the development of American aviation, and declared that it would prove a stimulus to the production of types which would avoid the Wright patents. Constructors here are following his advice, and are making every effort to bring out machines which cannot be held to be infringements. In this endeavour one of the most interesting developments is the attempt to escape the Wright patents by means of the Dunne biplane, the American rights to which were secured last Fall from the Blair-Atholl Syndicate by W. Starling Burgess, of Marblehead, Mass., one of America's most prominent aeroplane designers and constructors.

Several years ago the late Wilbur Wright expressed the opinion that the Dunne did not infringe his patents, but since the Federal Court judgment, Mr. Orville Wright, in view of the possibility of competition from the Dunne, has denounced this as a violation of the Wright claims, and has threatened to block the manufacture and sale of the Dunne biplane in the United States. The question of whether or not the British machine does infringe, therefore, will probably assume great importance, for it is the only possibility in sight at present for breaking the Wright monopoly. In this connection there looms up in large proportions a British patent, 1,469, granted in 1870 to Richard Harte. The controls used by Harte in his machine were followed with exactitude by Lieut. Dunne, and the Harte patent was raised in the Wright suit in America as being an "anticipation" of the Wright device.

Stripped of its technicalities the recent judgment upheld the claim of the Wrights to stabilizing control exercised; first, by moving the wing tips, through "means for simultaneously imparting such movement"; and second through the use of the vertical rudder in connection with the movement of the wing tips.

The justice of the decision no one disputes. The brothers Wilbur and Orville put a milestone in history when they taught the world that flight was an actuality. One must seriously question the wisdom, however, of Orville Wright's prohibitory attitude. That his course will mean an actual monetary loss to his company is generally agreed, for every constructor in the country to-day is ready to pay a reasonable licence fee.

As the case stands now, however, attention has been focused on the production of an aeroplane which will not infringe the Wright patents.

Harte was probably regarded as a bit "out," in his day. He was one of the unfortunates, in fact, who can see too far ahead. Here is Harte's specification for his aeroplane control:—

"At the end and back or hinder part of each wing is a flap which moves up and down upon a hinge in the back edge of the wing. This hinge is prolonged in the shape of a rod, and this rod is in connection with a lever, by means of which the flap is made to rise above or fall below the rest of the surface of the wing, this lever being in connection with a second lever which is within the reach of the person who steers the machine."

Now mark how close to this is Claim 1 in the Wright United States patent of 1906:—

"In a flying machine, a normally flat aeroplane having lateral marginal portions capable of movement to different positions above or below the normal plane of the body of the aeroplane, such movement being about an axis traverse to the line of flight, whereby said lateral marginal portions may be moved to different angles relatively to the normal plane of the body of the aeroplane, so as to present

to the atmosphere different angles of incidence, and means for so moving said lateral marginal portions, substantially as described."

The Wrights, however, apparently escaped an adverse decision on the ground of anticipation from the fact that in Claim three they included the provision, quoted above, "for simultaneously imparting such movement," namely, the movement of the wing tips, to "different angles relatively to each other." So much is made clear in the opinion of Judge Hazel, of the lower court, who said:—

"While the extensions (of the Harte aeroplane) may be movable above and below the normal plane of the main body yet there is no simultaneous manual control, and therefore, in my opinion, the described means do not correspond to the combination in Claim III of the Wright patent."

In the Harte device, as in the Dunne, which follows it exactly, the control of each "flap" is separate. Let us consider for a moment the manner in which an inventor of 1870 purposed to keep his craft on an even keel. After telling of the tendency of his machine to tip he goes on to say:—

"This I counteract by means of the flaps of the wings, each of which acts upon the principle of a ship's rudder, and their combined action is such that when one flap is turned up and the other down they simply counteract this tendency of the machine to rotate and keep it steady. When both flaps are depressed the machine will descend, when both are equally raised it will ascend, and when both are raised, but unequally, the machine will make a curve towards the side on which the flap is most raised."

The control there described is identical in every detail with that of the Dunne, indicating that Mr. Harte, back in 1870, was a man of brains, and added something quite beyond a "paper" patent to the annals of aviation. It would be curious, indeed, if this old invention should prove a stumbling-block to the monopolization of the air by the Wright Company.



The Jacques Schneider Aviation Cup, one of the important trophies offered for competition at Monaco flying meeting.

APRIL 18, 1914.

FLIGHT

MEN OF MOMENT IN THE WORLD OF FLIGHT



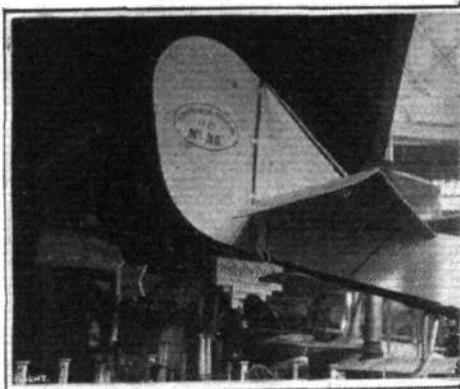
MR. J. E. B. THORNELY, who, as recorded in FLIGHT for March 28th, recently looped the loop on a Farman biplane at Eastbourne. Mr. Thornely, who will not be 18 until July 5th next, joined the Eastbourne Aviation Co.'s School in October, 1912, and last year practised on a Blériot monoplane and later on a Bristol biplane.

THE E.A.C. TRACTOR BIPLANE.

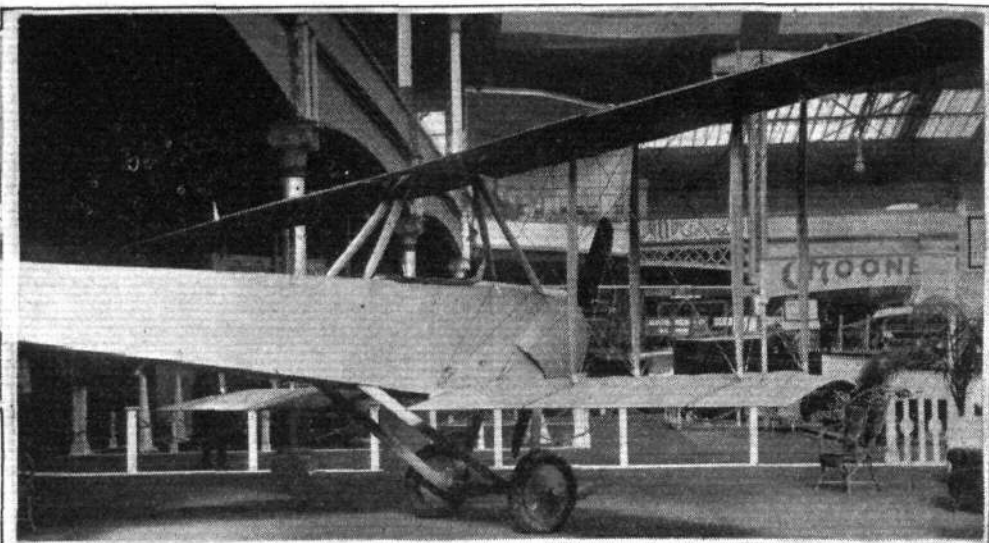
ALTHOUGH the biplane with which the Eastbourne Aviation Co. made their *debut* at the recent Olympia Aero Show does not differ radically, as a type, from already existing machines, there is ample evidence of the careful attention which the designer, Mr. E. L. Gassler, has paid to constructional details. Designed primarily to comply

and dismantled for storage and transport, operations occupying, we understand, only a few minutes.

The rectangular section *fuselage* is of the usual girder type, built up of ash *longerons* connected by struts and cross members, of which the front ones are steel tubes, whilst the rear ones are spruce. The *fuselage* is rather

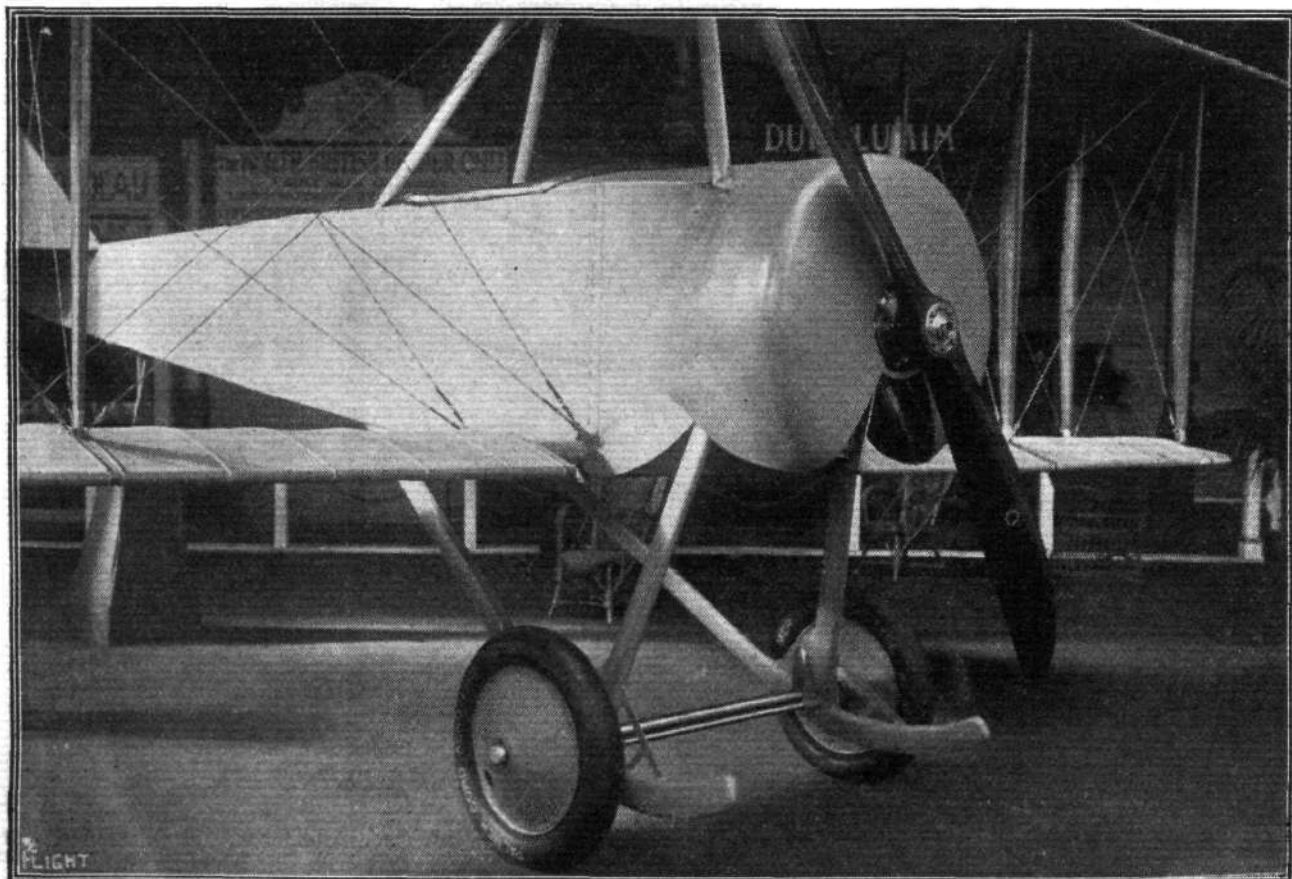


"Flight" Copyright.
Three-quarter rear view of the
E.A.C. tractor biplane. Left: the
tail planes.



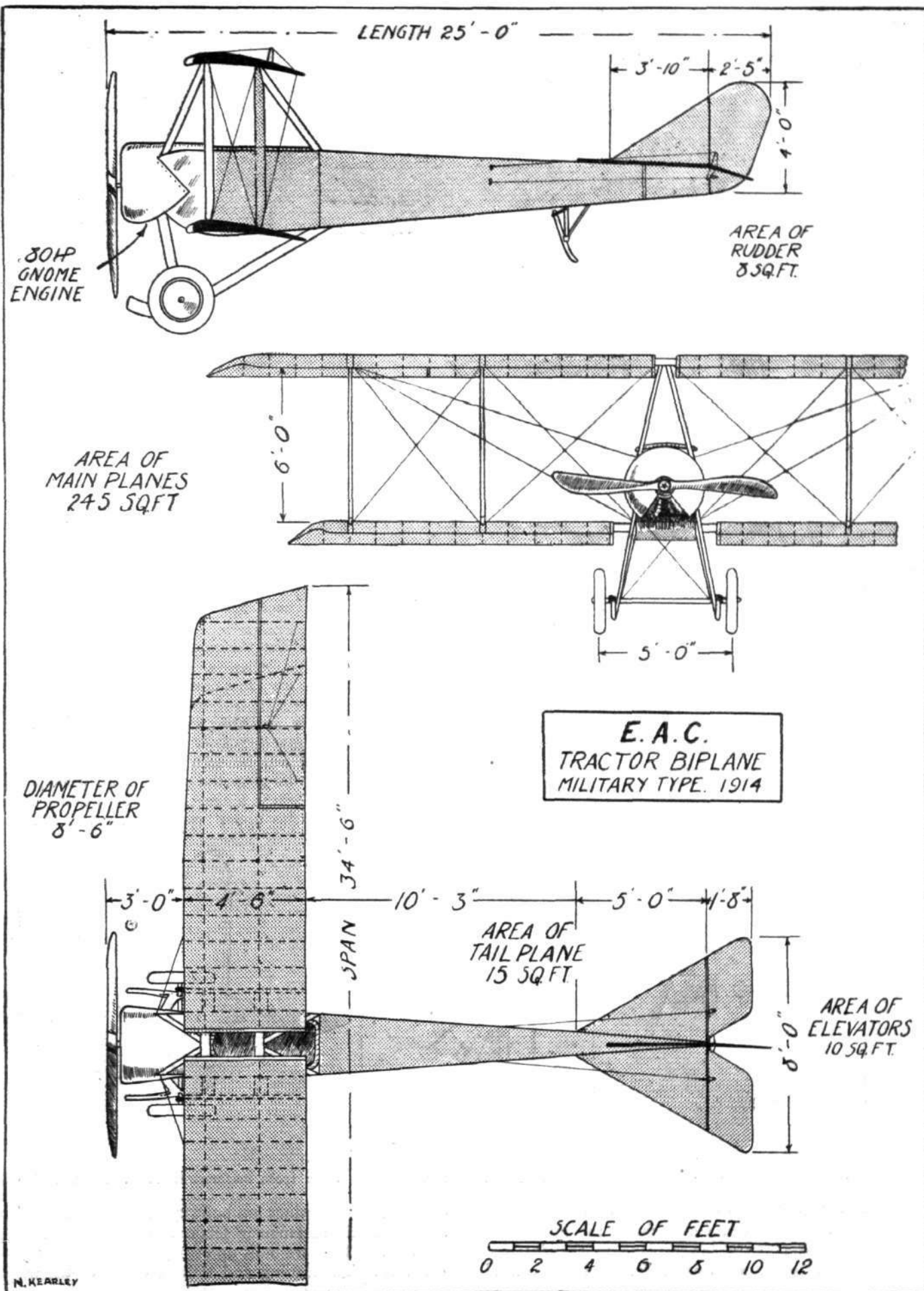
with military requirements, such features as would be desirable in a military machine have been closely studied, and every effort has been made to produce a machine which, whilst being sufficiently strong to stand reasonably rough usage, is still light enough to provide a good climbing capacity. Another feature which should be a point in its favour, is the ease with which the machine may be erected

longer in proportion to the span than one usually finds on machines of this type, thus providing a good leverage for the tail planes. Mounted on overhung bearings in the nose of the *fuselage* is the engine, an 80 h.p. Gnome, which is partly enclosed by an aluminium cowl for the protection of the pilot and passenger against oil spray. Inside the *fuselage* and between the engine and pilot's



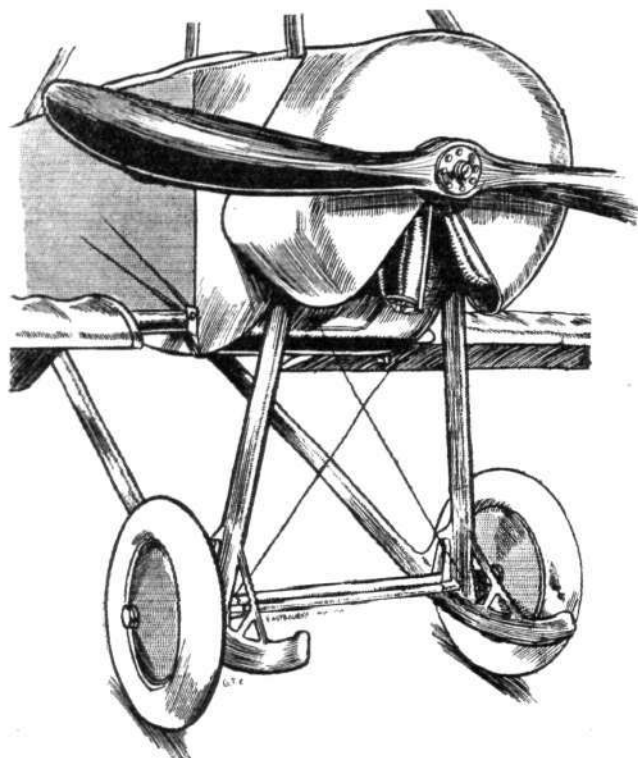
View of the chassis and *fuselage* of the E.A.C. biplane from in front.

"Flight" Copyright.



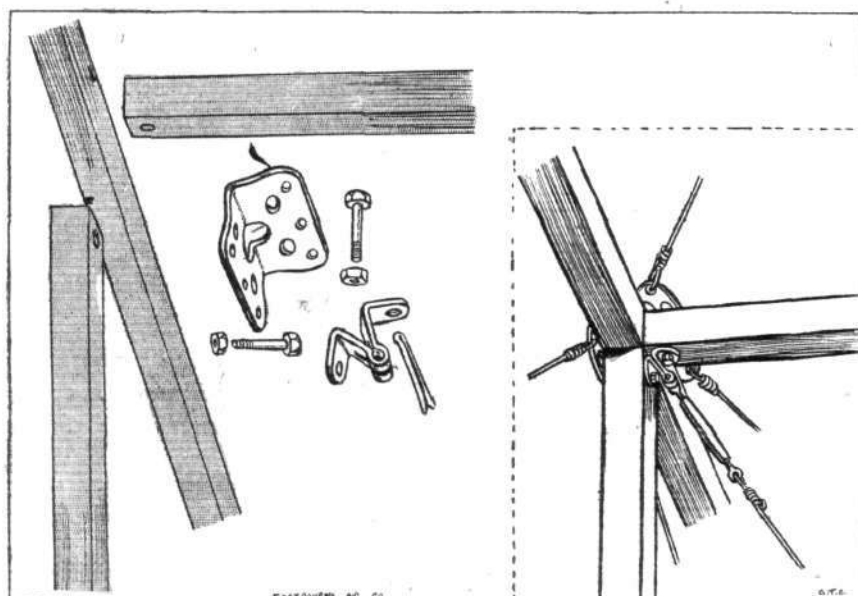
THE E.A.C. BIPLANE.—Plan, side and front elevation to scale.

seat are the oil and petrol service tanks. Petrol is forced to this service tank from the main tank carried behind the pilot's seat by means of a hand operated petrol pump. The pilot's and passenger's seats are arranged tandem



Chassis and engine housing of the E.A.C. biplane.

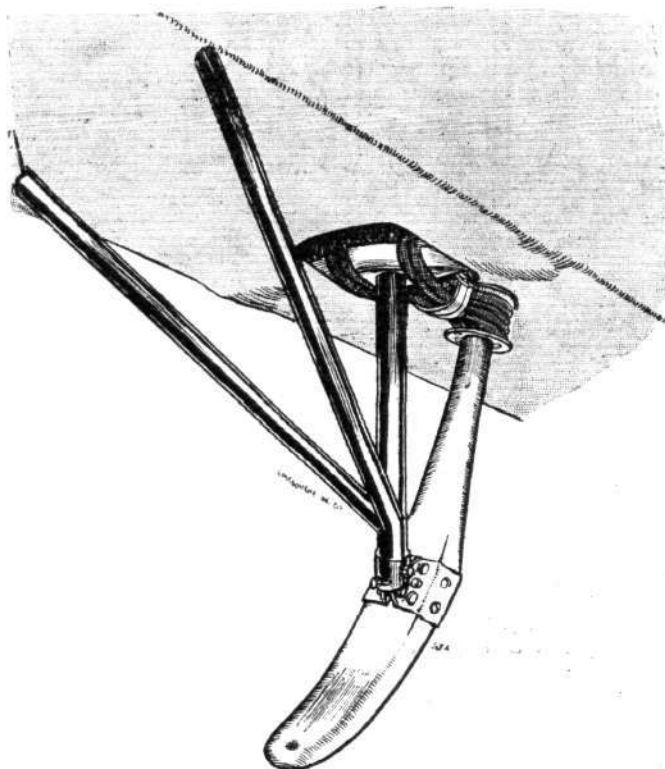
fashion, the pilot occupying the front seat. From the passenger's or observer's seat an excellent view is obtained, this being further enhanced by leaving the inner portion of the lower main planes uncovered where they join the *fuselage*. In order to reduce head resistance on the thus uncovered spars, these have been enclosed



Method of mounting upper main plane on E.A.C. cabane.

in streamlined casings, as shown in one of the accompanying sketches, which also shows the method of attaching the spars of the lower plane to the *fuselage*. Ailerons and elevator are operated by a single central column in front of the pilot, whilst the rudder is actuated by a pivoted foot-bar. The instruments carried are the

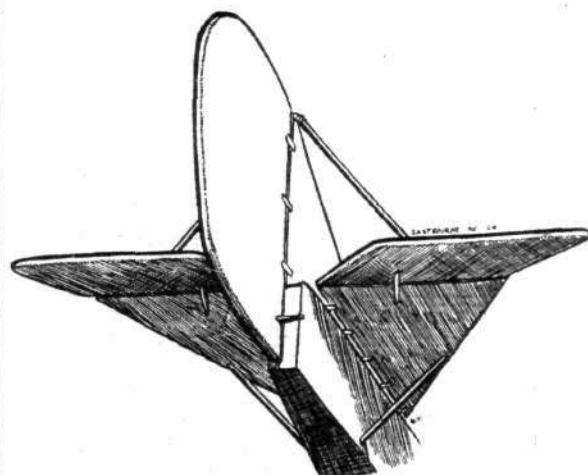
usual for cross-country work, such as altimeter, compass, clock, revolution indicator and air-speed indicator. A starting handle in front of the pilot makes it possible to



The E.A.C. tail skid.

start the engine without the necessity of any preliminary swinging of the propeller, a point which should be especially valuable for cross-country flying, as it enables the pilot to make a start without any outside assistance, which is not always available when making forced landings during a prolonged cross-country flight.

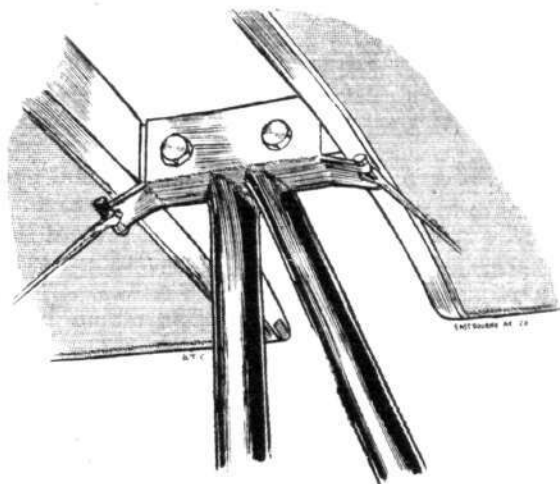
As will be seen from the accompanying scale drawings, the trailing edge of the planes is slightly longer than the leading edge, and the upper main plane has a slight



View from underneath of E.A.C. tail planes.

overhang. The wings are built up over two ash spars of approximately rectangular section, to which are secured the ribs. These are built up of poplar flanges on three-ply webs. The leading and trailing edges of the wings are formed by spruce stringers. It will be noticed that in the outer portion of the wing the leading edge slopes

backwards towards the front spar, but in later machines this feature will be discarded as making the wings more expensive to build and being of no particular aerodynamical value. The main planes are separated by four pairs of poplar struts, two pairs each side, whilst a *cabane*-like structure mounted on the upper *longerons* of the *fuselage* takes the place of the usual four upright struts in the central *cellule*. Cross bracing is effected by means of stranded cables terminating in the quickly detachable devices illustrated in one of



A neat way of joining struts and cross members to fuselage longeron of the E.A.C.

the accompanying sketches. By undoing these combined quick releases and turn buckles, the wings can be dismantled in a very short space of time. The angle of incidence is $4\frac{1}{2}$ degrees, and there is no dihedral angle. *Ailerons* are fitted to the top plane only.

The chassis is of a very simple type, consisting of two Vs of streamline steel tubes extended forward to form short tusks or skids. The axle rests in slots in flange pieces in the angle between the struts, and is sprung by means of rubber cord. Palmer cord tyres of large size are used, and the wheels are enclosed in fabric covers, in order to reduce the head resistance.

The tail planes consist of a flat triangular stabilising



The Fatal Accident at Brooklands.

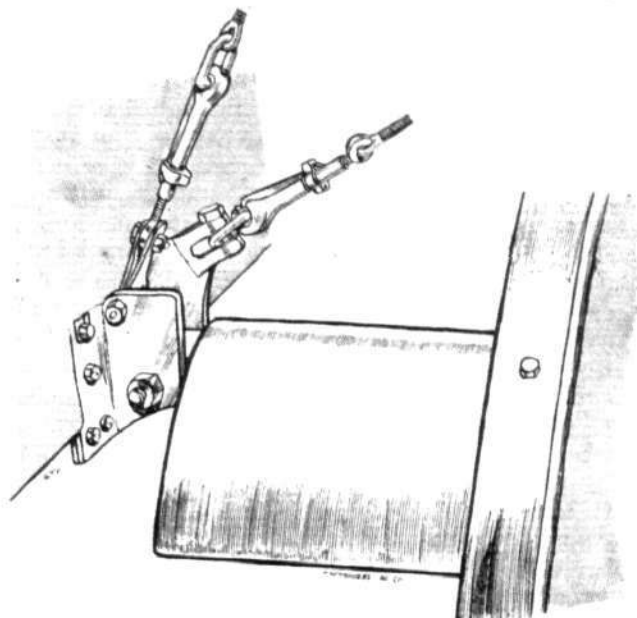
AT the inquest on the 9th inst., at Weybridge, on Sergeant E. N. Deane, who lost his life at Brooklands on the previous day, the evidence of those who witnessed the accident showed that the pilot was thrown from his seat through too steep a descent being attempted. Having completed figure eight tests for his *brevet*, Sergeant Deane went up for the altitude test, but instead of going up to 400 feet as instructed went up to 1,000 feet. He then shut off the engine and started a spiral descent at a very steep angle. When about 350 feet from the ground he was seen to fall from his seat, and the machine, after turning over twice, crashed to the ground. An examination of the machine showed that the controls were all in order, and Mr. F. W. Merriam, who had instructed the deceased, described him as an apt and intelligent pupil who gave promise of becoming an excellent pilot.

The jury returned a verdict of accidental death, and in a rider expressed the opinion that the Aero Club should be recommended to insist that all machines should be provided with straps and other necessary life-saving appliances to prevent possible accidents. If pupils did not use them, this would relieve schools of the responsibility.

French Pilots Killed in Morocco.

It was announced by the French Minister of War last week that a French flying officer and a mechanic had lost their lives under peculiar circumstances in Morocco. The officer, Capt. Herve, accompanied by Corporal Rooland, started on Sunday week from Casablanca to fly to Fez, along the Bou-Recreg valley. Apparently

plane hinged to the upper *longerons* of the *fuselage*. The divided elevator is hinged to the trailing edge of this fixed tail plane, and by undoing a few nuts both stabilising plane and elevator can be folded down flat along the body, thus taking up very little room. A small triangular



Attachment of lower spar to fuselage of E.A.C. biplane. Note streamline casing round spar where wing has been left uncovered.

vertical fin is fitted in order to counteract the forward side area of the *fuselage*, and to the trailing edge of this fin is hinged the rudder. A tail skid of the type shown in one of the accompanying sketches protects the tail planes against contact with the ground. The weight of the machine empty is 950 lbs., and her speed is expected to be from 50 to 75 miles per hour.

As soon as the machine is completed by the Eastbourne Aviation Company, she will be put through her tests, and there seems little doubt but that she will give a good account of herself, for Mr. Gassler is not only a designer of considerable experience but is also a very capable pilot.



they had been forced to land, and, on setting out on foot for the nearest military post, had been assassinated by robbers. Their bodies were found by natives on the following day.

The Forlanini Airship Disaster.

THE catastrophe which overtook the Forlanini airship "Citta di Milano" on Thursday of last week was the first serious accident which has occurred to the airship fleet belonging to the Italian Army. It appears that the airship with four officers, four ladies, and four mechanics on board, started from Milan with the intention of cruising to Como, but had only proceeded as far as Cantu when a serious leakage of gas necessitated a sudden descent, and in effecting this further damage was done to the airship. Not unnaturally, the landing caused a large crowd to gather, and as there were not a sufficient number of soldiers available to keep the crowd in check the work of repair was considerably hampered. The onlookers, many of whom were smoking, would insist on keeping close to the vessel from which the gas was escaping rapidly. Eventually there was an explosion, and the whole vessel was quickly reduced to a mass of tangled metalwork. About 50 people were injured as the result of the explosion, and one died in hospital the next day. It may be recalled that the airship, which was described and illustrated in FLIGHT for January 24th last, was 72 metres long and 18 metres diameter, and was fitted with two 85 h.p. Issota Fraschini motors. The airship was built as the result of a public subscription, and was presented to the Italian Government by the City of Milan. Several similar vessels are on order for the British Government.

LOOPING THE LOOP.

A PILOT'S AND A PASSENGER'S IMPRESSIONS.

It was just a year ago that I gave my impressions in *FLIGHT* of Chevillard's *chute de côté*. I thought it a wonderful experience then and said I would not forget it until someone took me up and flew a couple of miles upside down. I little thought at the time that it would really be possible for such a thing to happen, but aviation has made very rapid strides since then. I have not yet flown that two miles upside down, although it is now a by no means impossible proposition, but I have experienced the next thing to it—looping the loop, and I think that I must admit that the *chute de côté* is put in the shade somewhat by this latest method of flying. Before I received my *baptême de boucle le boucle* I asked Louis Noel, who by the way, is the first pilot to loop the loop on both biplane and monoplane, to give me his impressions of looping, and I cannot do better than record them here in his own words. Thus Louis Noel:—

"In asking me for my impressions of looping the loop, I fear you have given me a difficult problem; however, I will try, but I really think there are no words in which to express the sensation. As it is, the ordinary flight is quite exhilarating, but this new stunt quite exceeds everything in the world: in fact, in a word it is super-human. When once you have done it you feel you must repeat it again and again; you are so intoxicated with the wonderful sensation. You start off, and rise to a height of between 600 ft. and 700 ft., and then you can begin the joke absolutely without danger. After executing a gentle *vol piqué* you pull the lever back, and the 'bus leaps with tremendous speed upwards—which it loses at the zenith of the loop. At this moment you are completely isolated from the earth and you can see nothing but the planes. Then it is that an incomprehensible sensation runs through you at being absolutely alone, suspended by an invisible string amid air. I assure you it is a unique position; nothing to fear—only happiness. All this of course (unfortunately) is done and finished in a second or so, and, after diving again, you have the first glimpse of the earth under you and you can only regret that the looping is over. There is just one thing to consider, however; I think that if I 'loop' often I shall lose that wonderful feeling."

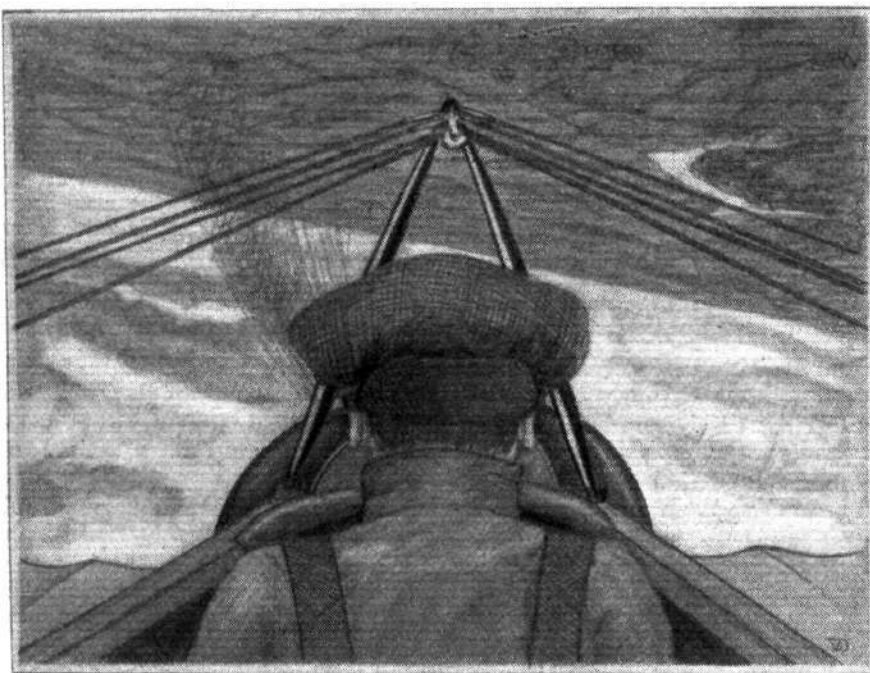
This last statement of Mr. Noel's is, I think, rather interesting, for although, no doubt, there would always be a certain amount of exhilaration when looping, the first sensations are so strange, so unlike anything one

previously imagined, yet not so very startling, and the whole procedure is over so quickly, that once you have done it you feel that you have been doing it always, and the strangeness wears off. I asked Noel if he felt safe, and he said "absolutely," adding:—

"Many people witnessing a looping exhibition think surely the pilot is risking his life; nothing of the kind! On a suitable machine it is quite safe, and a competent pilot will find that he will accomplish his first 'loop' far more easily than his first straight flight, and I agree with Hucks that every well-trained, good pilot can do it easily.

"Again, people say that it serves no useful purpose, but I think otherwise; it is well to know *how* to do everything it is possible to do, and at the present stage of aviation I feel safer on a 'looping' machine than on a machine on which it is dangerous to do it."

"Well," he said, "those are my impressions: but why not loop the loop yourself, and see if you agree with me?" And so, on Saturday last, I ascended with Noel on the rebuilt "G.W." 80 h.p. Le Rhone-Morane-Saulnier monoplane, and "saw for myself." I might mention here that Noel took out the Morane-Saulnier for the first time in his life on Good Friday, and succeeded



An impression of looping the loop with Noel at Hendon. [

in executing two loops with a passenger. My own impressions of looping are much the same as Noel's, but there is one point that has struck me particularly, and that is the fact that I could not realise that I was upside down. I did not feel any tendency to fall out, and if I had shut my eyes I would not have known, for the greater part of the time, that we were not flying normally. Before I ascended I took the precaution of seeing that what little coin of the realm I had in my pocket would not fall out when in an inverted position, but, as I found later, quite unnecessarily, for, once in a way, my money remained quite securely in my pocket. As far as I can put it in words, my sensations from start to finish were as follows:—After climbing to a height of about 600 ft., Noel turned and inquired if I was ready, and then we dived slightly, the feeling in this case being similar to that during a *vol plané*; the ground stretched out before us, then suddenly "rolled" out of sight as the nose of the machine was turned upwards, and there was nothing but the clouded sky all round. The rush of wind, which had been intense, then seemed to die out altogether for a second or so, and now

one felt that wonderful feeling Noel spoke of, of being absolutely alone and extraordinarily happy. The next sensation was exceptionally weird, for suddenly there was a terrific rush of air and the earth came into view from behind and above, and passed with startling rapidity in front of the machine, just as if someone had thrown a roll of green cloth over one's head from behind so that it unrolled as it went. As the ground passed from overhead to the front of the machine, the sky again came into view overhead, coming up from behind as did the earth, and I realised then that we were diving and that we had been upside down. All this time I felt absolutely comfortable in my seat and it was only when we were recovering our normal position that I felt any rough

movement. Each time we made the loop we came out of the top of it slightly sideways, so that when the horizon line appeared above our heads it was not absolutely horizontal. As I said before, although I saw, for the space of two or three seconds, the ground stretched out above my head, I had no feeling of being upside down, owing, no doubt, to the fact that centrifugal force made my position feel quite normal. Yes! looping the loop is a really magnificent experience—but I do not propose this time to say that I will not forget it until someone takes me up in an aeroplane and does something or other remarkable, for I cannot think of anything impossible enough now for an aviator or pilot to do.

"VEE JAY."

FLYING AT HENDON.

THE SEVENTH LONDON AVIATION MEETING.

THE wonderful progress made in aviation could not have been indicated to better advantage than by the Seventh London Aviation Meeting, which opened on Thursday afternoon of last week and closed on Monday last. The only blank day was the Thursday, when the weather was so bad that hardly anyone ventured either to fly or come out to see flying. The remaining four days, however, more than made up for the disappointing Thursday both as regards the flying and the attendance of visitors. The latter was estimated to be in the neighbourhood of 120,000 for the four days, and there were quite as many, if not more, packed all round the surrounding country. Many celebrities also visited the aerodrome, amongst whom may be mentioned Queen Amelie, Queen Augusta Victoria, Lady Eileen Vivian, the Baron and Baroness De Meyer, Baron de Gunsburg, Lord Dalrymple, &c. The band also made its first appearance on this occasion, whilst an innovation consisted of a vocalist in the person of Miss Rose Murray,

who rendered several songs at the piano outside the tea pavilion in the paddock. So far as the flying itself was concerned, it is difficult to say which day was the best or most wonderful. Looping the loop was, of course, the principal feature, but whereas at previous looping demonstrations the air was cleared of all aeroplanes whilst looping was in progress, this time the other machines not only went up as usual, but on one occasion four machines looped at one and the same time. Gustav Hamel also put up a record by making 22 successive loops, and many others besides, in addition to tail slides and turn-overs.

Good Friday.

A strong gusty wind prevailed on the Friday, which necessitated the racing event down on the programme being abandoned, otherwise the weather was bright and sunny. The proceedings were opened at 2.45 p.m. with a fine 13 minute flight by R. H. Carr on the 50 h.p. G.-W. tractor biplane "Lizzie," on which he executed



Miss Kitty Kent, who is appearing in "The Girl from Utah" at the Adelphi Theatre, is taking up flying at Hendon. Our photograph shows Mr. Noel just about to give her some practical experience in the air.

three loops. Philippe Marty was the next out on the 80 h.p. Blériot with a passenger, after which Goodden gave another looping demonstration on the Caudron, making three loops at 1,500 ft. Hamel then ascended and put up a wonderful display of looping, lasting some 15 minutes, on his 80 h.p. Morane-Saulnier. Some more looping was then given by Carr on "Lizzie," after which Goodden ascended once more on the Caudron, and from a height of 1,800 ft. executed six successive loops. Later on Henri Salmet made a flight on a Blériot, and E. Baumann came out on the Wright biplane and made a 23 minute flight at 800 ft. A new looper then made his appearance in Marty, who ascended on the 60 h.p. Morane-Saulnier which had been re-built at the Grahame-White works, and made three loops from a height of 1,800 ft. Louis Noel then came out on the re-built 80 h.p. G.-W. Morane-Saulnier, and, accompanied by a passenger, looped the loop twice at 900 ft.

Saturday.

Saturday was also bright and sunny, though still windy, and fully 20,000 spectators turned up. The first events consisted of combined looping displays by Carr on the G.-W. tractor "Lizzie," and Marty on the 60 h.p. Morane-Saulnier, W. Birchenough and J. M. Cripps giving exhibitions the meanwhile on G.-W. 'buses. L. A. Strange then gave a display on "Lizzie," Noel following immediately after on the 80 h.p. Morane-Saulnier with a passenger, and making a loop at 500 ft. Goodden then ascended on the 60 h.p. Caudron, and climbing to an altitude of 2,000 ft., where he disappeared behind the clouds, he executed eight successive loops, two of which were made behind the clouds. Marty then took up a passenger on the Blériot, after which a start was made for the cross-country handicap to Bittacy Hill and back four times, for the Barclay Walker Cup. There were five starters in this race, as follows: W. Birchenough, on the G.-W. bi-rudder 'bus (9 mins. 43 secs.); F. W. Goodden, on the 60 h.p. Caudron (4 mins. 6 secs.); R. H. Carr, on "Lizzie" (2 mins. 4 secs.); P. Marty, on the 60 h.p. Morane-Saulnier (54 secs.); and Louis Noel, with E. G. Dunn as passenger, on the 80 h.p. Morane-Saulnier (scratch). Birchenough maintained the lead throughout, and Goodden also retained his original position, Noel and Marty following close behind, third and fourth respectively, whilst Carr gave up at the end of the last lap. At the close of the race, Carr, Marty and Noel, without landing, proceeded to give a combined looping display, whilst Goodden put up all manner of contortions on the Caudron. Then followed a series of exhibition and passenger flights by Cripps, Birchenough, Lillywhite and Strange on Grahame-White biplanes, E. Baumann on the 40 h.p. Wright (Wright engine), Goodden (passenger) on the Caudron, and Carr, with a passenger, on "Lizzie." A private speed match round six laps of the aerodrome was then arranged between Noel and Marty. The former, flying the 80 h.p. Morane-Saulnier with a passenger, was at scratch, and gave Marty, on the 60 h.p. Morane-Saulnier, a start of 26 secs. This match resulted in a very close finish, Noel failing to obtain first place by 3 secs. Before landing, both Noel and Marty put up some more looping and tail slides. Carr then took up another passenger on "Lizzie," and A. E. Barrs made a fine high flight on the little 35 h.p. Deperdussin monoplane, E. F. Norris following on the G.-W. 'bus 109. Baumann, Birchenough, Goodden, and Marty each took a passenger on the Wright, G.-W. 'bus, Caudron, and Blériot respectively. Strange then had a turn at looping on "Lizzie," whilst Carr made a short flight on the Blériot. Crawshaw, accompanied by a passenger, made a cross-country flight on a 70 h.p. Blériot, and R. T. Gates put up some flying on the bi-rudder 'bus before the proceedings were brought to a close with a looping display by Noel on the 80 h.p. Morane-Saulnier, our representative, Mr. Vernon Jones, being the passenger on this occasion, which is, we think, the first time a member of the Press has looped the loop in this country.

Sunday.

Another glorious day brought up a greater attendance than ever, about 30,000, in fact. Just after 3, Cripps, Birchenough and Howarth went up on the three G.-W. 'buses, and Strange and Baumann flew the 80 h.p. Blériot and the 40 h.p. Wright respectively. Carr on "Lizzie," Goodden on the 60 h.p. Caudron, Marty on the 60 h.p., and Noel on the 80 h.p. Morane-Saulnier all "went mad" and churned up the air in an alarming manner. It was then that Hamel put up his wonderful record of 22 successive loops. He ascended on his 80 h.p. Morane-Saulnier to about 5,000 ft., and from this height he descended making the aforementioned loops. After this series he made six side loops and tail slides, one of the latter being very sensational, for he not only dropped a considerable distance tail first, but when the machine nose dived, it did so very suddenly, so much so that as the nose swung earthwards it appeared to swing upwards again the other way, so that the machine was on its back. Then followed a rapid succession of exhibition flights and looping displays. Space will not permit us to refer to these in detail, but they can be summarised as follows:

Birchenough, Gates, and Howarth, flights on G.-W. 'buses, Carr and Marty passengers on the 80 h.p. Blériot, Crawshaw with a passenger on the 70 h.p. Blériot, Baumann with a passenger on the Wright, Barrs on the 35 h.p. Deperdussin, M. Zubiaga on a 60 h.p. Caudron, and Noel with passengers on the 80 h.p. Morane-Saulnier. Looping was put up by Goodden on the Caudron, Marty on the Morane-Saulnier, and Strange and Carr on "Lizzie." Goodden ascended to over 6,000 ft. above the clouds, and from this height executed 17 loops in succession, the last loop being made at 1,000 ft.; before landing he made two very perfectly formed loops at about 600 ft. Strange, in addition to making two loops, executed a tail slide. Hamel next took up Robert Loraine and looped the loop twice, and later he took up R. T. Gates and also looped. Baumann, Birchenough, and Cripps then made some further flights, whilst Noel and Marty put up some very low loops. Grahame-White then did some very fast flying on the 60 h.p. Morane-Saulnier, and Marcus D. Manton made a welcome reappearance on his old friend the bi-rudder 'bus, on which he put up some of his magnificent spirals. The final flights of the day were made by Goodden on the Caudron.

Monday.

Easter Monday was undoubtedly a record one for Hendon, and was a greater one, even, than Aerial Derby Day. Large numbers of spectators arrived long before noon, and remained until late in the evening, showing that there is plenty of interest in flying on the part of the public. By the afternoon the "gate" had grown to 50,000 strong, and the enclosures were packed with people and motor cars. The one and only accident occurred on this day, but it was only of a very slight character, nothing more, in fact, than a brief argument between the ground and the G.-W. 'bus No. 107, piloted by Mr. Howarth, with but little damage. Numerous exhibition and passenger flights were made before the luncheon hour by the various Hendon pilots, but the principal event was a private speed race between Claude Grahame-White on the 60 h.p. Morane-Saulnier and R. H. Carr on the tractor biplane "Lizzie." Both pilots flew a magnificent course, Carr winning by a bare second. At 3 o'clock Goodden on the 60 h.p. Caudron executed several loops at a great height. Immediately after, the first heat of the speed handicap for the Barclay Walker Trophy was made. The first heat of four laps produced five starters:—J. M. Cripps on G.-W. 'bus 109 (2 mins. 51 secs.); W. Birchenough on the bi-rudder 'bus (2 mins. 23 secs.); F. W. Goodden on the 60 h.p. Caudron (1 min. 20 secs.); L. A. Strange with a passenger on the 80 h.p. Blériot (15 secs.); and P. Marty on the 60 h.p. Morane-Saulnier (scratch). Marty made a magnificent effort from scratch, and came in first by 7½ secs., Cripps and Goodden being second and third respectively by 3 secs. each. Strange, who was flying his first race on the Blériot, was unable to overtake Birchenough, and therefore came in last. Immediately after the race, Noel on the 80 h.p. Morane-Saulnier and Carr on "Lizzie" each did three loops at heights varying from 500 to 800 feet, Carr in addition doing a couple of tail slides. Noel introduced a new stunt into his loops, consisting of a corkscrew twist just before the machine flattens out. Four started in the second heat, which was also of four laps; these were: R. J. Lillywhite on the bi-rudder 'bus (2 mins. 49 secs.), E. Baumann on the 40 h.p. Wright (2 mins. 41 secs.), R. H. Carr on "Lizzie" (58 secs.), and Louis Noel, with a passenger, on the 80 h.p. Morane-Saulnier (scratch). This heat resulted in a magnificent finish, the first three coming in within 1 sec. Lillywhite was first, with Carr ½ sec. behind, and Noel was third, ¾ sec. behind Carr. Both Noel and Carr flew in fine style, but Baumann unfortunately flew inside at No. 1 pylon and so was not placed. After this heat Hamel gave a looping display, during which he made three single loops at from 200 ft. to 400 ft., five successive ones at 900 ft., and nine successive ones at a similar height, in addition to several side loops and tail dives. Passenger flights were then made by Baumann on the Wright, Carr on the 80 h.p. Blériot, Crawshaw on the 70 h.p. Blériot, Goodden on the Caudron, Noel on the 80 h.p. Morane-Saulnier, and Strange on "Lizzie." The final heat (8 laps) of the speed handicap was then flown, but when about six laps had been completed it was discovered that owing to an error the scratch man had been started one minute too soon, so the heat had to be flown over again. The order of starting and handicaps were as follows:—Cripps (6 mins. 2 secs.); Lillywhite (5 mins. 11 secs.); Carr (1 min. 46 secs.); and Marty (scratch). Cripps and Lillywhite on the two 'buses had an easy victory, the former crossing the line 4 secs. in front of the latter, whilst Marty came in third 24 secs. after Lillywhite and 16 secs. in front of Carr. Before landing after the race, Marty proceeded to put up some more looping, Hamel ascending on his Morane-Saulnier and keeping him company at the same game. After this Hamel took up three passengers, and gave one loop and one side loop to each. The proceedings were brought to a close with a few more flights by Baumann, Barrs, Marty and Goodden.

FROM THE BRITISH FLYING GROUNDS.

Royal Aero Club Eastchurch Flying Grounds.

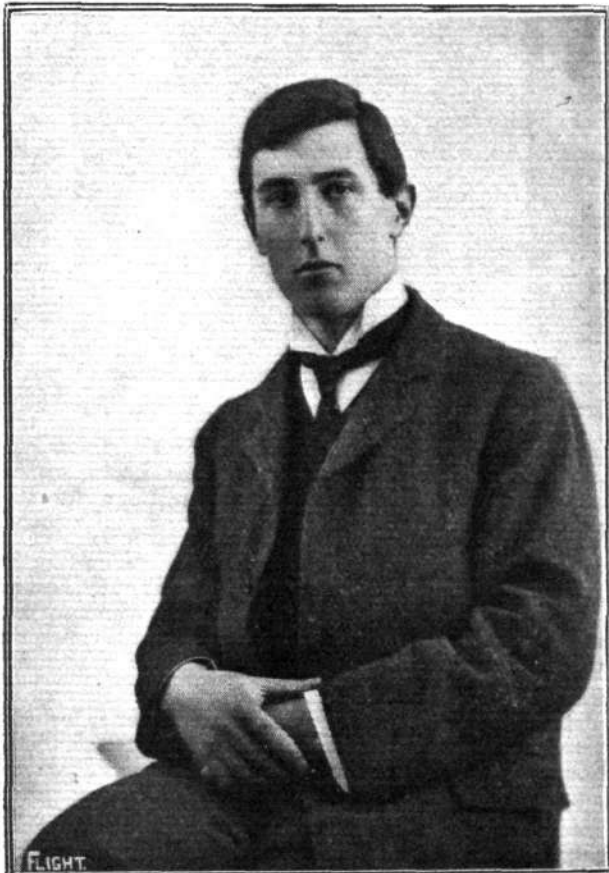
MONDAY last week very windy. Lieut. Davis made a short flight on the 80 h.p. Sopwith in the afternoon.

Tuesday very windy. Short 50 h.p. was the only machine up.

Wednesday rather windy. A much better day for flying, the Navy taking advantage of it, having the following machines up: 80 h.p. Sopwiths 27 and 33, Bristol tractor 80 h.p., Shorts 50 h.p. and 80 h.p., Caudron 50 h.p.

Thursday, windy and showery. No. 2 Short 50 h.p. class under instruction. Friday, no flying, windy. Saturday, rather windy. No. 27, 33, 104 80 h.p. Sopwiths out, also Caudron 50 h.p. and Short 50 h.p.

Civilian Flying.—Sunday, The Hon. Mr. Egerton two flights on his 50 h.p. Short. Prof. Huntington one short flight.



Mr. Cyril F. Lan-Davis, who passed his pilot's tests at Brooklands on an Avro.

Brooklands Aerodrome.

ON Monday and Tuesday last week there was no flying. Mr. R. B. Hunt arrived on his Blériot monoplane from Eastbourne.

Before breakfast, Wednesday, the conditions were almost perfect for school work and full advantage of them was taken by the Vickers and Bristol pupils. During the morning Lieut. Wilson arrived from Farnborough on a 50 h.p. Avro. In the afternoon Lieut. Collett was flying the D.F.W. biplane, and Mr. Manton Mr. Hucks' Blériot monoplane.

Thursday, Mr. Alcock made a number of flights on the Maurice Farman biplane, and the Vickers pupils were at work.

Mr. Hunt was out Friday morning on his Blériot, and in the afternoon Mr. Manton on Mr. Hucks' Blériot.

On Saturday a number of interesting flights were made respectively by Mr. Vincent Waterfall, now thoroughly at home on the new Martinsyde monoplane; Mr. Pixton on one of the new 80 h.p. single-seater "tabloids" ordered by the Army from the Sopwith Company for use as "scouts"; Mr. Pixton on the two-seater Sopwith biplane; Mr. Lan-Davis on his Avro biplane with and without passengers; whilst Mr. Mahl was "taxying" on the Sopwith biplane.

On Sunday a large number of people took advantage of the fine weather to visit the aerodrome, and were well rewarded for their trouble. Mr. Vincent Waterfall made a number of flights on the new Martinsyde monoplane, on which he took up the winners of the two free passenger flights—Mr. V. H. Jaques, of the Hurst, Hershaw, and Miss Gruar, of the Balmoral Hotel, Southampton.

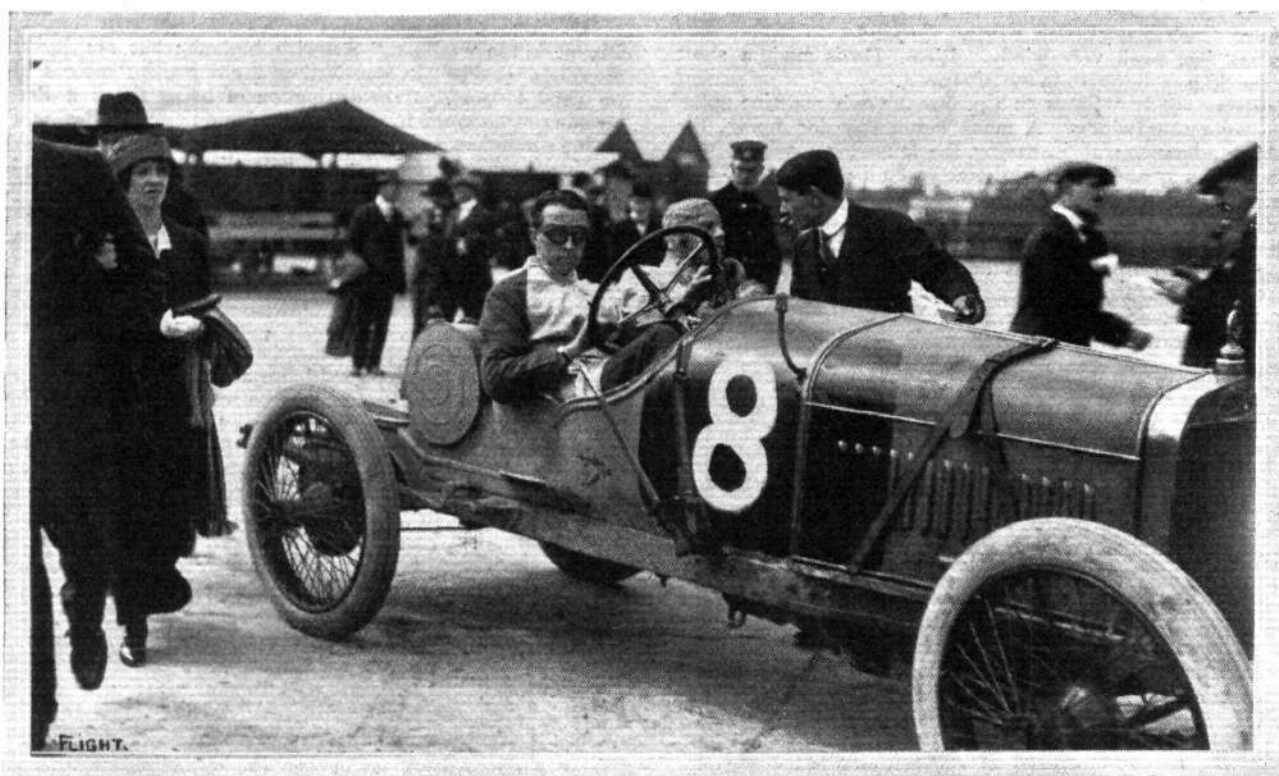
Mr. Alcock was out on the Maurice Farman biplane, Mr. Pixton on the "tabloid" Sopwith biplane; but the flights of the afternoon were by Mr. Barnwell on the Sopwith "tabloid" biplane, on which he achieved the distinction of being the first Brooklands airman to "loop the loop," after having quickly climbed to 4,000 ft. In the strong sunshine and at the height the evolution was carried out it was difficult to follow every detail of movement, but to most it seemed that the machine, after turning vertically upwards, fell to one side, and then, turning over, completed the loop prior to planing down. Mr. Tom Sopwith ran out to greet Mr. Barnwell and to ask him exactly what he had done, to which question the aviator called out: "That's just what I've come down to ask you!" His idea of his movements, however, coincided with the above opinion, so, apparently quite satisfied as to what he had to do the next time, he immediately restarted, and at his second attempt made three very good loops at a height of about 3,000 feet. On his return to *terra firma* he had a warm reception by the crowd near the "Blue Bird." It is worthy of note that nobody has previously attempted the feat on a machine approaching the speed of the Sopwith "tabloid." Mr. Barnwell seemed to think nothing of the feat he had accomplished, merely remarking after his second attempt: "I began rather to wonder where the world had got to that last time!"



Mr. D. G. Murray, who has just taken his *brevet* on a Caudron biplane at the W. H. Ewen School, Hendon.

Easter Monday at Brooklands.

DURING the progress of the motor racing a number of interesting flights were made by Mr. Alcock (Maurice Farman biplane), Herr Roempler and Lieut. Collett, R.N. (D.F.W. biplanes), Mr. Pixton (Sopwith "tabloid"), Mr. Merriam (Bristol biplane), Mr. Busteed (Bristol "scout"), who arrived from Salisbury, Mr. Hunt (Blériot monoplane), Mr. Barnwell (Blériot monoplane and Vickers biplane), Mr. Elsdon (Vickers monoplane), Mr. Knight (Vickers biplane). There were eight starters for the Easter Aeroplane Handicap, namely, Mr. Merriam (Bristol biplane), Mr. Knight (Vickers biplane), Mr. Barnwell (Blériot monoplane), Mr. Elsdon (Vickers monoplane), Herr Roempler (D.F.W. biplane), Mr. Alcock (Maurice Farman biplane), Mr. Waterfall (Martinsyde monoplane), and Mr. Pixton (Sopwith biplane), Mr. Merriam being on limit and Mr. Pixton on scratch. The race was a keenly contested and exciting one, Mr. Barnwell being first on the Blériot monoplane, Mr. Knight second on the Vickers biplane, and Mr. Pixton third on the Sopwith biplane. After the race, Mr. Barnwell again executed some "loops" on the Sopwith biplane, after which the crowd



"Flight" Copyright.

Mr. C. Grasswell, who is so well known in aeronautical work, in a new rôle. He appeared as a car racer for the first time at Brooklands on Easter Monday, when he piloted the Hispano-Suiza in the Easter Private Competitors' Handicap, securing third place.

simply stormed machine and pilot, and Mr. Barnwell had to run away and fly off in the Vickers biplane to escape the importunities of innumerable autograph hunters.

Bristol School.—No tuition was possible on Monday and Tuesday owing to the exceptionally strong wind. The school closed on Thursday for the Easter holidays.

Vickers School.—Wednesday, last week, Knight and Elsdon on biplane with Lieut. Underhill, Lieut. Acland solo. Thursday, Knight and Elsdon on biplane with Capt. Phillips and Lieut. Underhill. Lieut. Acland and Mr. Wilberforce solos.

London Aerodrome, Collindale Avenue, Hendon.

Grahame-White School.—Wednesday, last week, Prince Sapieha solo straights. Messrs. Parker and Kershaw solo circuits. Mr. Smiles and Major Piercy straights with Instructors Howarth and Strange in passenger seat.

Thursday, Messrs. Smiles and Moore, straights with Instructors Howarth and Strange in passenger seat, afterwards Mr. Smiles solo straights. Messrs. Parker, Kershaw and Prince Sapieha solo circuits.

Bzatty School.—Instructor during last week M. Beauman. Pupils with Instructor on machine: Messrs. Ding, 48 mins., Watts, 20 mins., Stewart, 12 mins. Watts and Stewart taking extra practice.

Salisbury Plain.

Bristol School.—Wind and rain prevented any tuition on the first three days of this week, and the school closed on Thursday for the Easter holidays.

Shoreham Aerodrome.

Pashley School.—Friday, Saturday, Sunday last week, and Monday, Instructor C. L. Pashley up with Instructor Wright, Nicholl, Mortimer, Dawson and Willett. Straights alone: Nicholl, Mortimer, and Gray. Circuits: B. F. Hale.

Mr. C. L. Pashley took the Farman to Bognor on Saturday, but arrived too late for the race. A rough journey was experienced owing to the strong wind. The machine took 65 mins. to cover 18 miles.



ROYAL FLYING CORPS (MILITARY WING).

WAR OFFICE summary of work for week ending April 11th, 1914:—

No. 2 Squadron, Montrose.—In spite of the uniformly bad weather throughout the week, the pilots of the squadron covered 2,814 miles in all. Practice in reconnaissance work was continued.

No. 3 Squadron, Netheravon.—A considerable amount of reconnaissance work was carried out, although the weather was unfavourable during most of the week. Experiments in photography were continued successfully.

No. 4 Squadron, Netheravon.—The Officer and N.C.O. pilots of the squadron made numerous flights during the week, and some experimental work was carried out.

No. 5 Squadron, S. Farnborough.—The weather during the week was most unfavourable, but cross-country reconnaissances were carried out on Wednesday.

No. 6 Squadron, S. Farnborough.—The weather has been unsuitable for much flying, but cross-country reconnaissances were carried out on Wednesday.

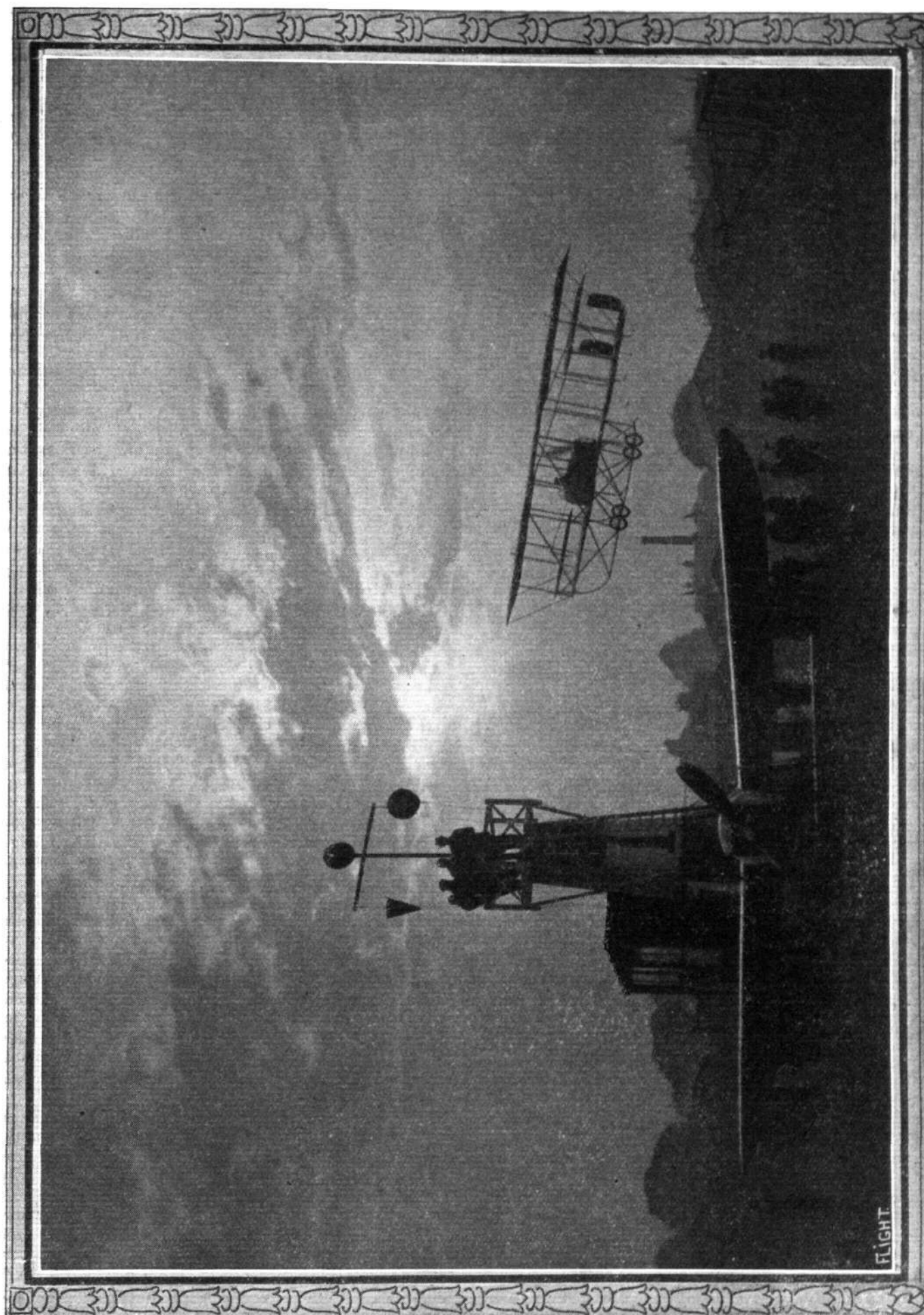
Aircraft Park, S. Farnborough.—Repair work on aircraft and mechanical transport was carried out in the workshops, and the technical training of recruits was continued.



Capt. Barnby, R.F.C., N.W., flying one of the 100 h.p. Short seaplanes at 1,000 ft. at the Leven Air Station.

APRIL 18, 1914.

FLIGHT



AT HENDON AERODROME.—Louis Noel on the Maurice Farman rounding No. 1 Pylon towards evening.

SOME IMPRESSIONS OF A CROSS-COUNTRY FLIGHT.

"I AM taking the Albatros biplane to Farnboro' this afternoon. Would you care to accompany me?" This was the invitation I received the other day from Herr Thelen, the famous pilot of the Albatros biplane. Needless to say I accepted the invitation, and a few minutes afterwards we were on our way to the Hendon Aerodrome. Arrived there the mechanics were busy filling up tanks and going over everything to see that the machine was in order, while Herr Thelen and I sat down to study the map. I had, of course, been to Farnborough several times, but never by air, whilst Herr Thelen was perfectly unacquainted not only with the route but also with the place itself.

However, after consulting Mr. E. R. Whitehouse and obtaining some valuable information from him as to the best route to follow, we decided that, as it was a comparatively clear day, we ought to be able to find our way, and so we climbed on board and, after a preliminary run of the engine, Herr Thelen gave the order to let go and we were off. A couple of circuits of the Aerodrome gave us sufficient altitude to set out across country, and soon we were heading past the Welsh Harp, which glittered bright below.

According to the directions given us by Mr. Whitehouse we should leave Harrow on our right. I looked for it in vain for some moments, first through the wind-screen and later, as Harrow-on-the-Hill refused to reveal itself through the mica screen, I craned my neck in order to look over it; my efforts were rewarded, for there, on the right, I could discern the church. From this height, however, it was a little difficult to understand how Harrow has derived its appellation, for of the Hill, on which I knew the church to be built, I could see no signs; it looked, in fact, as flat as all the surrounding country. This is one of the difficulties of cross-country flying, you may be coming down in a field which looks flat from above, but which, on closer examination, turns out to be the side of a hill.

The weather had been beautifully calm when we left Hendon, the pen on the wind gauge dragging itself lazily along the O line, but clouds were gathering and it looked for some time as though the element in which we were flying was going to be semi-aquatic. Shortly after passing Harrow we ran into a *remous* which caused us to drop a considerable distance. The sensation, when the "solid" air was met again, was exactly similar to that experienced on a ship in a rough sea.

In a few minutes we could see the reservoir at Staines approaching rapidly, and as this was one of the landmarks we had to pass, I began to feel that it would probably be easier to find our way than I had anticipated, in spite of the mist which hung over the Thames Valley and prevented us from seeing more than a couple of miles in any direction. Near the Staines reservoir a balloon flying very low passed immediately underneath us, and was soon out of sight again.

After indicating to Herr Thelen, by means of a sort of deaf and dumb system decided on before the start, to lay the course a little more to the South, I fell to experimenting with locating various places on my map. The numerous bends in the river around Staines afforded excellent opportunities for doing so, and I was thinking that I was doing rather well, when it suddenly dawned upon me that I was holding my map the right way up—that is to say with the North arrow pointing away from me—whilst we were flying in a South-Westerly direction and that, therefore, the bends in the river, which I saw

on the right, were to the left of our course as I was looking at it on the map. By the time I had got the map turned round we had left the river behind, and I was suddenly disturbed in my geographical studies by a yell from the pilot. Looking back I saw him pointing to the South, where, after a few moments, I picked out the race track at Brooklands.

I now began to look out for the sheds at Farnborough, which I had been told one could see—in clear weather of course—shortly after passing the reservoir at Staines. I soon picked out the London and South-Western Railway, which was, however, far less conspicuous than were the roads, which, as they were dry, were plainly visible from above. In front and on the right I saw a white sheet which at first I took to be Virginia Water and, thinking that we had turned too far North I was just going to give directions to turn a little to the left, when an emerging train drew my attention to a tunnel which I located on the map, and according to this we should be very close to Farnborough, so that evidently the white sheet on the right could not be Virginia Water. Later I realised that it must have been one of the numerous commons around this part of the country. I looked in all directions but could see no signs of our destination until I happened to look straight down and there, vertically below us were the huge dirigible sheds. I pointed them out to Herr Thelen, and soon we were circling down in wide spirals in order to ascertain the best landing place, as I was not sufficiently well acquainted with the ground near the sheds to know exactly where to land. Skimming along a few feet above the ground we were rapidly approaching the sheds, when the pilot opened out the throttle fully and we shot up over the hangars and made another circle around the factory and sheds at a low altitude, and a few moments later alighted in front of the hangars, to be quickly surrounded by numerous members of the R.F.C., who immediately commenced an interested examination of the machine. From the comments overheard it was evident that the general impression of the machine was favourable. I must give a word of praise to the Mercedes engine, for throughout the whole trip she ran beautifully, and, as far as I was able to judge, never misfired once from the time we left Hendon until we reached Farnborough.

After filling up the tanks of the machine Herr Thelen proceeded to put her through the tests, the first of which was the climbing test. Accompanied by the official observer and with a full load of fuel the machine reached the required altitude of 3,000 feet in exactly eight minutes. Next to be passed were the speed tests, which were flown over a measured course, three times in each direction for the fast speed, and twice in each direction for the slow speed. The results of the speed tests were not available when we left Farnborough, so I am unable to give them here.

After going through the speed tests the machine was taken out on the rather rough ground at the upper end of Laffan's Plain in order to go through the rolling tests, which were, I understand, passed satisfactorily. The last remaining test consisted in landing inside a circle marked on the ground with white. The machines must touch the ground inside the periphery of the circle and come to a stop before reaching the opposite periphery. Herr Thelen manœuvred the machine so skillfully, that the wheels touched just a few inches inside the line, and by vigorous application of the brake, which sent the turf flying in all directions, he succeeded in



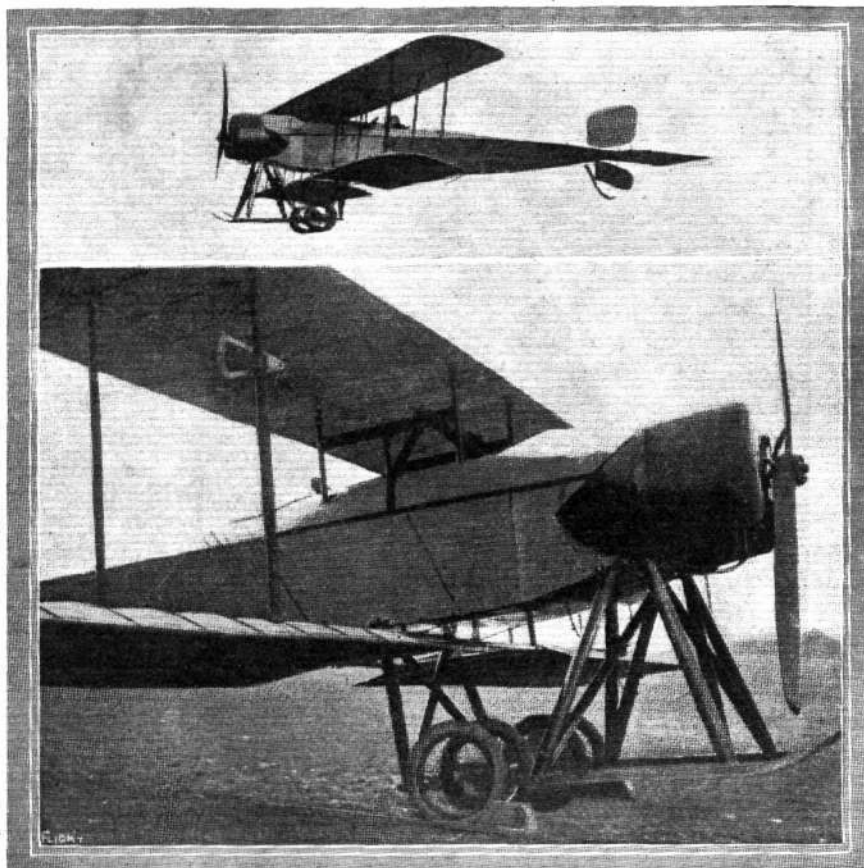
THE EASTER TRIP—RUEBING IT IN.—The usual official "Yer name and address—landing ain't allowed 'ere."

bringing the machine to a standstill in the centre of the circle. This concluded the tests, and after giving the mechanics orders to put the machine into the hangar we returned to London by train. On thinking over my experiences after getting home, the thought occurred to me that I had travelled by a goodly number of different

conveyances during the day, firstly, tube to Golder's Green, thence by tram to Edgware Road, from where I proceeded by bus to Collindale Avenue. From Hendon to Farnborough by air thence by motor to Farnborough Station, and the final stage home by train. Truly we live in a wonderful age. C.M.P.

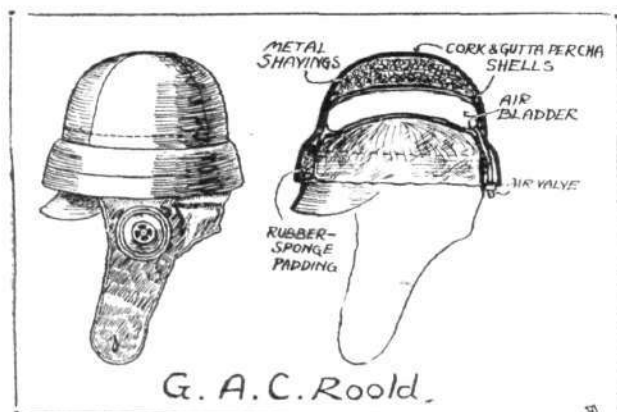
THE PAUL SCHMITT BIPLANE.

At the time of the Paris Show we gave a full description of the Paul Schmitt biplane, with an illustration of the method whereby the angle of incidence may be altered during the flight. The recent excellent performances of this machine in the hands of M. Garaix, who, it will be remembered, has beaten the world's height record with six, seven, eight and nine passengers, seem to prove the advantage of the variable angle of incidence in conjunction with its complement, the variable power. It will be noticed that when the angle of incidence is maximum the inter-plane struts slope backwards in relation to the fuselage, thus providing a rearward stagger of the planes. It might appear at first sight that the alteration of the angle of incidence by pivoting the planes round the transverse horizontal axis would lead to displacement of the centre of gravity, but this possibility has been guarded against by so calculating the position of the transverse axis around which the planes are pivoted that the resultant centre of pressure for both planes remains the same, with regard to the centre of gravity, throughout the entire series of alterations of the angle of incidence which ranges from 0° to 12° . The machine is fitted with a 14-cyl. 160 h.p. Gnome engine driving an Integral propeller.



THE LATEST G.A.C.-ROOLD SAFETY HELMET.

SOME considerable improvement will be found in the latest pattern G.A.C.-Roold safety helmet, which Messrs. The General Aviation Contractors, Ltd., of 30, Regent Street, London, S.W., received from Paris during the recent Olympia Aero Show. Referring to the accompanying illustration it will be seen that this new helmet still retains the original characteristics both in general appearance and construction, with the addition of a further shock-absorbing medium



in the form of a pneumatic bladder. The outer shell of the helmet is made of a composition of cork and gutta percha, which in itself has remarkable shock-absorbing qualities. Fitting inside this outer shell is another one made of the same material, so fitted that a space is formed between the two shells. This space is filled with a quantity of metal shavings of special manufacture. Under-

neath the inner shell is a rubber bladder, against which the crown of the head abuts, whilst a leather lining comes between the head and the bladder. The latter is inflated in the ordinary way with a tyre pump, the valve being situated in the base of and at the back of the helmet. The base of the helmet forming the brim is also padded, with a rubber sponge-like material, and projects so as to form a protection for the face. The combined action of the bladder, the metal shavings, and the cork compo. shells renders the helmet proof against heavy blows and shocks to a remarkable degree, whilst the complete helmet is exceptionally light and strong. The wide leather chin straps are provided with ear pieces, and the helmet is covered with a washable fabric called "Loreid" either in black or khaki.

Protection for the eyes is provided by means of a peak projecting from under the brim, whilst a model is also made having an extension for protecting the neck. Compared with some safety helmets, the G.A.C.-Roold is decidedly handsome in appearance, looking not at all unlike a Colonial sun helmet.

THE ROYAL FLYING CORPS.

THE following promotion was announced in the *London Gazette* of the 14 inst. :-

R.F.C.—Military Wing.—Capt. Andrew G. Board, the South Wales Borderers, from a Flying Officer to be a Flight Commander. Dated March 1st, 1914.

British Headquarters of Blériots.

AFTER May 1st, the general offices of "Blériot Aeronautics" will be transferred to the new works of the company at the Brooklands Aerodrome, Weybridge, Surrey, where all communications should be addressed.

THE VALUE OF BALLOONING AS A TRAINING FOR FLYING.*

By GRIFFITH BREWER, A.F.Ae.S., and Lieut. J. N. FLETCHER, R.F.C.

Mr. Brewer's Paper.

MEMBERS of this Society may be forgiven if, in view of the glorious progress of aviation, they regard the balloon as an extinct species of aeronautical apparatus. The object of this paper is to show that, in spite of the strides aviation has made, the balloon still has its part to play in the navigation and study of the air, and that those who go to the trouble of making balloon ascents not only reap considerable pleasure by employing that means of transit, but they also learn facts about the atmosphere which may be of service to them in becoming more than mere chauffeurs of aeroplanes.

The Knowledge of the Atmosphere.—The best sailors who navigate our steamships have served their apprenticeship on sailing vessels, where they learn the true force and effects of winds and gain a knowledge of the sea not so readily acquired under steam power. In the same way, I venture to suggest that the much-despised balloon is a means for acquiring a knowledge of the atmosphere which cannot be gained when tearing through the air at fifty miles an hour. A balloon floating freely in the air moves at the exact speed of the wind, and by observing the apparent movement of the ground immediately below, the speed of travel of the air may be accurately measured, and thus the true direction and speed of the wind at various altitudes may be noted.

The Balloon is a Good Observatory.—Complete silence and freedom from vibration enable the aeronaut to make accurate observations, whilst a sense of security due to the car being in constant stable equilibrium facilitates calm thought and appreciation of atmospheric phenomena, which cannot be so readily experienced when flying on an aeroplane.

Getting Used to the Air.—One advantage to be gained by practising ballooning before adopting aviation is that the balloonist may acquire familiarity with dangling his toes in space and steady his head in proportion to his altitude. A nervous man can, by being lifted calmly into space, become accustomed to looking down from considerable heights without that sense of nervousness which is a considerable handicap and strain to some aviators; and, having once acquired this familiarity with height, he may then undertake the lessons in control of a machine, without the added handicap of being unaccustomed to high altitudes. Becoming accustomed to looking down from a great height is of great assistance to a pupil commencing aviation, but the main benefits derived from a ballooning training are those which give the aviator who has acquired sufficient skill to take his "ticket" the additional knowledge which will carry him beyond that standard of mental efficiency at which many aviators are content to rest. Perhaps the chief knowledge gained by the practice of ballooning, which may be of service in training a man for pioneer work in aviation, is the knowledge gained of the atmosphere in respect to the speed and direction of gusts. The probable development of weather conditions, with their bearing on the voyage to be made, and the ability or practice of keeping a position on a map without following a railway or other landmark in order not to lose his way, are also lessons learnt best in balloons.

The Aeroplane is a Bad Observatory.—The reason the air cannot be studied properly from an aeroplane is that an aeroplane must, in order to remain in the air, be travelling at a high rate of speed. Can you imagine anyone wishing to find out all about the movements of the wind confining his study to the bridge of the "Lusitania" during her passage to New York? To get any results at all he would have to make complicated calculations involving the subtraction of the vessel's speed of twenty-five knots from the result obtained by other tests, and all sorts of other errors would be obtained, including whirls and eddies set up by the passage of the vessel through the atmosphere. Compare with this the advantage the same individual would obtain if, instead of choosing the bridge of the "Lusitania", from which to take his observations, he obtained permission to sit on the top of the Eddystone Lighthouse. There every puff of wind that blew could be registered correctly in the direction from which it came, and although allowance might possibly have to be made in some conditions for the presence of the lighthouse itself, and even for the presence of the observer, yet the errors which would creep into such calculations would be infinitely smaller than those which would bustle in from all quarters on the bridge of the "Lusitania."

Piloting by Sound.—Mr. Horace Darwin has described a most interesting theory of the way migrating birds guide their flight by the sound of distant breakers on the sea shore. In support of the

theory, he kindly referred to my having heard the breakers of the sea shore on the North of France when in a balloon still over England. The hearing of those breakers is impressed vividly on my mind, because it was the only confirmation Mrs. Assheton Harbord and I had that the wind we had trusted to carry us to France was worthy of the confidence we had placed in it.

From the experience I have had of aeroplanes in flights with Mr. Orville Wright and with Mr. Alec Ogilvie, I have not been able to hear them speak to me at a distance of two feet, much less hear the breakers on the sea shore twenty or more miles away. In a balloon, the absolute stillness enables the slightest sound to be heard, and, as Mr. Horace Darwin points out, "The intensity of the sound from a single source, such as a dog barking, will vary inversely with the square of the distance, but if the sound comes from a line instead of from a point, its intensity will only vary inversely as the distance." Mr. Mervyn O'Gorman points out that this is one of the reasons why the sea breaking on the shore can be heard at such a distance. When aeroplane engines are fitted with efficient silencers, those who fly will be able to check their course and position by sound, in the way Mr. Darwin now suggests migrating birds are in the habit of doing.

An Explanation of the Ground Calm of a Summer Night.—On several occasions the practice of ballooning has suggested explanations to my mind of the cause of atmospheric movements, which, if true, must be of value to all who navigate the air. One example of this is an explanation of what happens in the atmosphere in the summer time, when, after a stiff breeze all day, the night falls with the air dead calm, the stars come out brightly, and the smoke goes straight up from the chimneys, and yet the wind continues to travel fast above. The conclusion I came to was that the air split at nightfall into upper and lower layers, the upper one continuing to travel, while the lower layer comes to rest, and in the morning the two join again.

To support this theory, one must prove three things. First, that the wind does continue to travel above; second, that two layers can sharply separate; and, third, why they should separate and afterwards reunite.

On a clear night in the summer time, when the wind falls calm on the ground at sunset, the continued movement of the upper air cannot be observed by movement of clouds, although occasionally, when there are separated clouds, they can be observed to be travelling in the original direction. Such optical observation does not indicate the shallowness of the ground calm, which I have found on many occasions to be less than 200 ft. deep.

In proof of this, I will cite two instances. Once, when making a balloon ascent at Battersea Park, the balloon was standing perfectly straight on the ground before we left. No sooner had we cleared the gasometer than we travelled eastward down the Thames at about twenty miles an hour. An hour and twenty minutes later we made a temporary descent at East Horndon, Essex, and we were still travelling fast when the trail rope, which was 300 ft. long, had a considerable portion on the ground. When, however, the car was perhaps 50 ft. from the ground, the balloon entered the calm, and we came to a dead stop. We remained in the field for the rest of the night, and when the sun came out in the morning the breeze sprang up on the ground, and we continued our excursion for another half-hour or so, when we made a landing near Rayleigh, in Essex, in a wind of not less than thirty miles an hour. The landing was a rough one, which makes it all the easier to remember. On another occasion, going up from Wolverhampton with a hydrogen balloon just before sunset, we travelled westward at about twenty-five miles an hour, and then we came down in a field into an absolute calm. On this occasion also the calm was not reached until most of the trail rope was on the ground. We left the next morning before sunrise, and before the trail rope was completely off the ground we resumed our journey at the original speed of twenty-five miles an hour.

I could give many other instances of similar night calms on the ground and continuation of wind above, such, for instance, as most of the Gordon-Bennett Balloon Race days in September or October. From Paris, in 1906, St. Louis, 1907, Berlin, 1908, were all similar days, when we started in the evening calm, and yet travelled as fast by night as we did on the following day.

Now to prove my second point—namely, that two layers can sharply separate. Every balloonist of any experience must have observed that winds travel in definite layers. A wind up to perhaps 2,000 ft., blowing from the South-West, may change to West or even North-West immediately above that altitude. The

* Papers read before the Aeronautical Society of Great Britain at the Royal United Service Institution, Whitehall, S.W., on April 15th, 1914.

two layers of air travel smoothly, with only the smallest area of disturbance between the two layers; and when it is remembered that there are thousands of square miles over England alone of contact surface between the two layers, one must at once realise that the friction between the two layers must be infinitesimal in order to preserve their distinct directions.

I now come to the third point—namely, why the wind should fall calm on the ground whilst remaining in swift motion above. It is obvious that wind travelling in contact with the ground must meet with considerable resistance. This is proved by the comparatively slow travel of air when measured close to the ground, and its increase in speed at higher altitudes. Consequently, the air under the influence of friction-drag caused by proximity to the earth's surface, tends to arrest the progress of the air above, and if the tenacity of the large bulk of air be sufficient to move the ground layer, the latter travels with it; if it be insufficient, then the air splits, leaving the lower portion stagnant, and the upper portion travelling at the original pace.

This would explain why they separate, but it does not explain why they join again when the sun rises. I assume that a constant mixing or interchange between the travelling atmosphere and the ground layer is necessary in order that the ground layer may be moved under the influence of the upper layer. At night there is nothing to cause disturbance in calm air on the ground, but when the sun comes out in the morning, objects on the ground become slightly heated, and cause bubbles of air to rise from the stagnant portion below into the portion which is moving above. A bubble of warmed air rising soon becomes a twisting column, and when you think that the proportion of thickness between the two layers of air may be likened to two table-cloths spread over a table, it will be readily realised that when some thousands or millions of these columns or bubbles are rising from one layer to the other layer, and similar quantities of cooler air are descending to take the place of the rising air, then the effect is similar to the effect of the upper table-cloth becoming pinned to the stationary under table-cloth, with the result that the two layers again move along together.

In order to show that I have not digressed too far away from my subject, I will endeavour to illustrate how an understanding of these wind conditions might have saved the lives of perhaps more than one flyer. Imagine an aeroplane coming down from a great height, head on to a wind blowing twenty miles an hour. On arriving, say, 100 ft. from the ground, the machine runs suddenly into the stagnant ground layer of air, and the flying speed through the air is immediately reduced by twenty miles per hour. The machine naturally stalls and dives, and the altitude being insufficient to recover control, the machine strikes the ground before control can be recovered. Many accidents have occurred owing to the diving of machines just prior to landing when perhaps 100 ft. in the air, and I cannot help thinking that wider knowledge gained in ballooning may add to the understanding of the air, and thus increase the safety of pilots when flying and prove beneficial in their training.

Lieutenant Fletcher's Paper.

Mr. Griffith Brewer has raised a large number of interesting questions in his share of this lecture, and has covered the ground very completely. It is left to me to remark on special features of the subject in their application to military aviation, and perhaps to amplify somewhat further some of the original problems.

The Pioneer Work of Ballooning.—It will probably never be recognised how much the science of aviation owes to ballooning. Ballooning at the present day is in danger of sinking into complete obscurity, at least in this country, and I think also in France. Its use becomes less apparent every day, and I am very glad to have the opportunity to plead for it, though I cannot but regret that you should have been robbed of the pleasure of hearing Major Maitland speak on a subject on which his experience gives him the first claim to address you to-night. He has, however, very kindly allowed me to draw on his experiences and ideas.

Ballooning must be given credit for the work it has done in the past. Many of the most elementary bits of knowledge stored away in the experience of aeroplanists of to-day owe their entire conception to ballooning. The whole branch of lighter-than-air flying owes its being to ballooning. And the ground has not yet all been broken. There is a great deal of work to be done; and many lines of study are daily opened to balloonists, and can, indeed, only be carried out by balloonists. The subject falls into two headings, viz., the value of ballooning as a preparation for flying and the value as actual training. I wish to make it clear that the first heading is a fair sub-division of the lecture. It is to my mind of the utmost importance from a Service point of view. Experience of the air we fly in is necessary. Accurate knowledge cannot be gained from mobile aircraft; it is our object to show that it may, in part, at any rate, be gained from a proper development of the science of ballooning.

Wind Charts.—How many aeroplanists are aware of the

interesting phenomenon mentioned by Mr. Brewer that the wind direction varies at different altitudes? And of those who know that the wind's direction alters how many have tried to make use of their knowledge?

On July 13th, 1912, a long-distance balloon race was held. The day was hot and thundery and the ground wind fickle. Pilot balloons sent up before the race drifted eastwards down the Thames. Those who watched the clouds saw the lower ones travelling South, but the mackerel sky above travelling North. Seven balloons went up from Hurlingham, of which four went South to Brighton at an average height of not more than 5,000 feet. The other three, choosing various altitudes, according to their ballast capacities, made Southampton, Bath and Market Harborough respectively. The last-named must have travelled at an average height of 12,000 feet. The balloon I was in described a very marked "S," the northerly inclined limb, from south of Godalming to Fleet, being at 10,000 feet.

An aeroplane flying on that day from London to York, 200 miles approximately, could, by flying at 10,000 ft. instead of 3,000, have saved about two hours on the journey. The two opposing currents were, I should say, about 20 m.p.h. at each level. The condition can be predicted by meteorologists, and it is of no small importance to aeroplanes to know and make use of it. Their endurance is limited to say five or six hours at war load. If, then, they can find favourable currents in all directions, they can save much petrol and oil, and add a considerable percentage (in the case we have considered about 50 per cent.) to the number of miles they can travel in the air. On the chance of effecting such a saving it is worth while to climb to various heights and observe progress over the ground at those heights. This can now be done very easily by means of a little camera-obscura apparatus, in which the time taken for the image of a ground object to pass between two lines can be read off directly (as a function of the height) as speed over the ground.

It might well be remarked here to those who object that too much is being demanded from the aeroplane pilot, that war is a scientific game, and must be waged scientifically. If by application of scientific methods we can increase the aeroplane's radius of action ever so little, then those methods are worth adopting; and the pilot must be trained accordingly.

Sea breezes.—Sea breezes provide another important field of research for balloonists. On one occasion Major Maitland left London in his balloon in a flat calm. After hanging motionless for an hour or so he decided to go up higher, and went to 9,000 ft. through the clouds. There he remained 1½ hours out of sight of land. I have his permission to point the moral which follows. For he then heard the hoot of a steamer, and on coming down to investigate, found the Newhaven boat just arriving, as it were, at his feet. Moral: Do not remain in balloons for more than half-an-hour anywhere in England out of sight of the ground. This is made an order for military balloons, and should never be forgotten by anyone. A record descent was made, but at about 800 ft. a strong sea breeze was met, which carried him Londonwards at 25 m.p.h. Unfortunately, lack of ballast prevented him from saving railway fares to any appreciable extent, and he had to land. It would have been interesting to know where and why that breeze would have failed. Many countries in this world have nothing but sea and land breezes for six months in the year. Use could be made of them in much the same way that the barge and the steamer alike use tides to help them up and down the Thames.

The e matters can only be properly investigated by balloonists, for, as Mr. Brewer points out, you cannot investigate wind strengths and directions from the deck of an ocean liner.

Suggested Scientific Organisation of Ballooning.—I should like here to plead for some kind of organisation among balloonists in this country. A few individuals make weekly ascents from London. They store up for themselves a vast deal of experience and weather wisdom, but little of this gets any further. On the other hand, most German aeronautical papers give a page or two to ballooning. A synopsis of balloon ascents for the month chronicles always some two or three hundred ascents. Another page is given to the more interesting ascents; and altogether, it is clear that an organisation exists to provide a common fund of experience from which all can draw. I would go further. I would suggest that the Meteorological Office amplify its wind chart system, and publish daily information of the upper currents, so far as they can be ascertained or predicted, and that ultimately a probability chart be got out showing upper wind directions and forces for all systems of weather. These charts would be liable to daily revision by telegraph, but they would be a great guide to pilots flying high. It is a formidable task. But if more people ballooned from more centres, and if they sent in their reports to a central registry, and if they would assist in the pilot balloon ascents made under the auspices of the I.M.A., we should, in five years, have an invaluable fund of knowledge. Night flying, fog flying, flying above clouds, would be as safe and certain as

navigation by dead reckoning is at sea to-day. In five years' time aeroplanes will be so safe, and so free from engine trouble, that to "bet on one's engine running" will be to bet on a certainty. That is to say, it will be possible to do all these things, which at the present time are regarded as too dangerous. But we shall then find that navigation is the difficulty. Here is, however, a little "ever ready" drift indicator, very simple and very quick to use, and involving no calculation and no drawing. From it you can read at a glance what course to steer to make good a certain course; and where you will be at any moment. But first we must have our wind chart. I believe such a thing is possible. The lack of these charts is at the present time the great gap in airship work. We still depend on seeing either ground, or sun, or stars. Dead reckoning, so often necessary, is not possible. May I be excused here for digressing from my subject? At the present day, I think more might be done than is done by the Meteorological Office. I am told on fairly reliable information that the commander of a German naval airship which met with disaster at sea was warned by wireless from the nearest Meteorological Office of the approach of a bad disturbance, the nature of which was not quite known, and was advised not to send the ship out. The exigencies of the situation decided him to send out the ship, however, which four hours later ran into the Line-squall which overwhelmed it. No such warning is possible in England except at stated hours. The Meteorological Office issues two reports only, early morning and late evening, so that the disturbance may actually arrive before the warning of it. I suggest that warnings of unusual disturbances be sent out at once to all aeronautical centres, so that aircraft may be stopped from going out in fine weather into certain bad weather. Further, the difficulty in plotting out wind forces and directions at any part of a cyclonic disturbance, is that the Meteorological Office does not issue any definite statement of the movement of the centre of the system. Its speed and direction should always be given, and any change in either speed or direction should be sent to aeronautical centres for distribution to aircraft carrying wireless. Again, as most systems work up from S.W., warnings of actual weather conditions sent from Plymouth or Bantry would give aircraft at least six hours' warning of the weather ahead. These warnings should be sent out every three hours.

The Training of Pilots and Observers.—I must now turn my attention to the second sub-division, i.e., to training pilots and observers. Ballooning might, I think, be more used for training observers. It produces quicker results in the elementary stages. A man will learn far more in three or four balloon ascents than he will in double that number of aeroplane flights. He will probably, too, reach greater heights in the balloon. The process is also attended with less actual risk and discomfort. Several ascents in aeroplanes are quite wasted, as the passenger is fully occupied in drinking in the new sensations. In the balloon, however, there are no new sensations except that of unusual calm. An instructor is always at the pupil's elbow to help him to learn, and there is no noise to prevent talking.

Aeroplanists among the audience know that cross-country flying is really very easy until trouble comes. How many pilots leave the aerodrome for the first time full of confidence? Never before have they had occasion to watch the country for possible landing places. How many of these same pilots have landed in green corn or standing hay and smashed up simply because they could not distinguish between these features and pasture land from 3,000 ft. up? How many aeroplane pilots can recognise the useless pasture that slopes like the roof of a house? The remedy I suggest is to take each would-be cross-country pilot for two balloon runs before sending him

off on his own. Point out that cattle or sheep are the only safe indications of pasture; that, failing cattle or sheep, one should look out for the scar in the gateway used by animals that is not present in standing hay or green corn fields. That when cattle or sheep are feeding with heads in the same direction, it indicates either a slope or a strong ground wind; that streams or woods at the edges of fields often indicate steep slopes. These can be learnt very quickly. Five or six pounds spent on ballooning is worth far more for the experience gained, and is an excellent insurance for the preliminary risks of cross-country flying.

While on this subject, I would like to suggest that a few balloons on the strength of the Staff College would provide all Staff officers with an invaluable grounding in aerial observations and would enable them to appreciate the situation from the flyer's point of view far more sympathetically than they are likely to if they have never flown.

Finally, I cannot leave the subject of training without pointing out that the balloon training is an essential part of every airship pilot's education. He must learn to read local conditions of temperature and wind. He must be skilful in the management of his gas and envelope. He must understand, inside out, the theory of ballooning. The bigger the airship the more he must know. Changes of temperature, up and down currents, affect airships in a way in which no aeroplane is affected, and without a thorough appreciation of the situation the airship pilot would soon be utterly fogged, and at a loss to understand the vagaries of his charge. If night flying is to be a principal rôle of airships, the pilot must be trained first in night ballooning. When real flying, away from illuminated aerodromes, becomes a possibility for aeroplanes, some regulation should be adopted to make each pilot do at least two night balloon runs before he attempts to cross unknown country by night.

Thunderstorms and Local Cloud Effects.—All aircraft avoid thunderstorms, as well they may; not a few nasty aeroplane accidents have been attributed to them, notably Capt. Reynold's smash at Bletchley, where he was upset by a thundercloud at 1,500 ft. Nearly every balloonist of repute has, however, been right through more than one storm. Can nothing be done to plot out the air disturbances by means of parachutes and pilot balloons set free from the car? The danger involved is, I believe, infinitesimal, though it is not a pleasant experience. Every cloud has its own peculiar air disturbances. The up currents in cumulus clouds are a distinct menace to unwary flyers, and measurement of their force would provide a balloonist with many hours of fascinating study.

Experiments.—Balloons provide the kick-off platform for many important experiments. Many books have been written on the subject. Perhaps one of the most interesting was Bacon's description of his sound experiments. Others are, photography, bomb-dropping, intercommunication, wireless, &c., &c., with the details of which it is not within the scope of this lecture to deal.

The atmospheric conditions over big towns and in mountainous regions require investigating. Those who have flown airships over London alone know what colossal bumps are to be met with there. It would be interesting to trace the smells of Soho to their ultimate destination!

The conclusion I hope this Society will come to is that there is a great scope for ballooning, and many problems to be worked out by its aid. There is a very serious necessity for more information about the air. The Society can assist by organising investigations, by interesting scientists and meteorologists in the problems that present themselves, perhaps even by finding money for the work.

The New "Wight" Seaplane on Trial.

THE "Wight" Seaplane, with 200 Canton-Unné motor, was out for the first test on the 7th inst.; there was a wind blowing at about 20 to 25 m.p.h., and the sea was very rough.

The machine left the water very easily at 35 m.p.h., and after flying for a short time, owing to the motor stopping a descent had to be made on very rough water. Owing to the state of the tide, it was some ten hours before the machine could be taken back to the shed, but she stood the buffeting of the sea without any mechanical breakdown at all. The flight was considered very satisfactory.

Easter at Shoreham.

ALTHOUGH there was no definite meeting arranged for Shoreham, some really excellent flying was seen during the Easter vacation, and quite a small crowd of onlookers attended. Cecil Pashley was out on the H. Farman and made several flights with passengers on Saturday, and also treated the spectators to some neat banks and spirals. The Cedric Lee circular monoplane, with Gordon Bell at the wheel, made a flight during the afternoon.

On Sunday, both Elliott and Pashley were out on their respective Farmans, and put up some good work.

The Pashleys' new Farman will be completed ere long, difficulty



in obtaining material causing the delay. It is probable that more people would have been present during Easter, but for the difficulty in gaining access to the 'drome. It is rumoured that a new approach may be instituted shortly.

Mr. Salmets Paris-London Non-stop Flight.

ACCOMPANIED by Count Fitzjames, Mr. Salmets made a fine non-stop trip between Paris and London on the 9th inst., on the Blériot two-seater monoplane which he will use during his tour of the country on behalf of the *Daily Mail* this season. Buc was left at 9.50 a.m., and good progress made in fine weather over France and across the Channel, but on reaching Folkestone, wind and rain were met. The machine was, however, headed for Hendon, but on reaching the Southern outskirts of London, as it was found that the petrol supply was getting very low, a descent was made safely at Addington, near Croydon. The journey of 210 miles had been covered in 3 hours 25 mins. The remainder of the journey to Hendon was made the following morning.

English Prince Loops the Loop.

AMONG the passengers taken up by Mr. Hamel at Bournemouth on Saturday was Prince Leopold of Battenberg, who enjoyed the sensation of looping the loop twice.

FOREIGN AIRCRAFT NEWS.

More R.E.P. Machines for French Army.

BEFORE a commission of French military officers, Molla on the 10th inst. at Buc, put half a dozen new Rhone-engined R.E.P. machines for the French Army through their official tests. Each machine, carrying a passenger and four hours' supply of fuel, climbed 1,000 metres in times which only varied between 8 and 8½ min.

Night Flying on a Blériot.

ON the 9th inst. Lieut. Quillien started from Buc at 10.55 p.m. on a Blériot machine fitted with a powerful searchlight, and for over half an hour flew above Buc, Versailles, and Chateaufort, &c., eventually landing at Buc without incident.

Flying After Dark Over the Sea.

NAVAL LIEUT. JANVIER on a Voisin hydro-aeroplane on the 7th inst. made a long flight after dark over the sea at St. Raphael, in the South of France, and he intends shortly to make a night flight from the French Naval Aviation centre at Frejus to Monte Carlo and back.

Testing a New Morane.

ON the 9th inst. some tests were carried out at Villacoublay with a new Morane-Saulnier monoplane of the parasol type, specially built for scouting purposes. The assembling and dismantling tests stipulated by the French Army were carried out in 3 mins. With Pequet in charge, and with an ordinary load, the machine climbed 1,000 metres in 6 mins. 40 secs., and on landing was pulled up in 35 metres. The speed of the machine was given as 120 kiloms. an hour.

12-Hour Flight by Poulet.

By way of training for a projected attack on the twenty-four hour record, Poulet on his Caudron biplane, fitted with Rhone engine and Integral propeller, on the 8th inst. made a flight lasting 12 hours. Eight times he flew from Etampes to Gidy and back, and then made a circuit of 91 kiloms., the total distance covered being about 860 kiloms.

Some New Loopers.

ON the 8th inst. at the Morane-Saulnier school at Villacoublay, the Russian aviator, Gaber-Vlinsky, looped, while two days later another Morane pupil, Rose, also carried out the manoeuvre. Another Russian, Pitzberg, looped at the Morane school on the 11th, while a Roumanian, Savoff, made similar flights at the Blériot school at Buc. At Crotoy on the 11th inst. Simon looped the loop on a Caudron biplane fitted with 50-60 h.p. Anzani motor.

Gustave Tweer, whose machine has landing chassis arranged on each side of the planes, as illustrated in last week's FLIGHT, looped the loop at Johannisthal on the 1st inst.

Rheims to Paris and Back.

ON his Nieuport-Gnome monoplane, Capt. Guillaubert on the 7th inst. flew from Rheims to Villacoublay in 1 hr. 55 mins., but the return journey, which was made later in the day, only occupied 1 hr. 5 mins.

Good Flight by Audemars.

ON his Morane-Saulnier monoplane, Audemars on the 9th inst., started from Lille and flew to Villacoublay, his time for the distance of 280 kiloms. being 2 hrs. 20 mins.



THE PANAMA PACIFIC INTERNATIONAL EXPOSITION.—A remarkable photograph of the buildings, &c., of the exposition in their present stage of construction, as seen from an aeroplane recently.

Long Flight in Company.

FOUR biplanes landed at the Ouges military aerodrome at Dijon on the 9th inst. The machines were piloted by Capt. Voisin, Sapper Bloch, and Sergeants Pelletier and Clement, and they had flown over from Mailly Camp.

By the Aerial Way.

HAVING received delivery at Buc of a new Blériot machine, Sergeant Pinsard on the 8th inst. flew it back to his station at Epinal, taking 2½ hours for the trip. On the same day, Sergeant Clamadieu, also on a Blériot, flew from Buc to Mailly Camp.

A Belgian Fatality.

WHILE making a first trial flight on a new biplane at the St. Jo aerodrome, near Antwerp, on the 8th inst., the Belgian pilot, Francois Verschaeve, fell from a height of about 1,000 metres, and was instantly killed. It is believed that a part of the warping gear broke.

Double Fatality in Germany.

WHILE flying at the Kaditz aerodrome at Dresden, on the 10th inst., something went wrong with one of the wings of a machine piloted by Hermann Reichelt, and it fell from a height of 500 metres. The passenger, Fraulein Steglitsch, was thrown from the machine and killed instantly, while the pilot was so severely injured that he died in hospital a few hours later. It may be recalled that last autumn Reichelt made a flight from Berlin to Paris.

Mishap With Parachute.

AMONG the attractions arranged at the Aspern Aerodrome, Vienna, for Sunday last, was a descent with a Bonnet parachute by Bourhis, from a Deperdussin machine piloted by Lemoine. When Bourhis jumped from the aeroplane, however, some parts of his parachute got caught in the steering gear, with the result that the pilot lost control. The aeroplane fell to the ground from a height of 500 metres, and Lemoine was severely injured. Although the damaged parachute failed to open properly, Bourhis escaped with little worse than a shaking.

A Long Flight in Italy.

ON a Blériot-Gnome on the 9th inst. Lieut. Bolagnesi flew from Piacenza to Padua, Milan, and Turin, landing at the Mirafiori aerodrome. The distance of 525 kiloms. occupied seven hours.

An Italian Fatality.

WHILE Lieut. V. Griffa was flying over the Mirafiori Aerodrome at Turin on the 31st ult., the machine side-slipped, and fell from a height of 40 metres. The unfortunate pilot was killed instantaneously.

Dr. Amundsen in the Air.

AT Christiania, on the 8th inst., Dr. Amundsen was taken for an aerial trip by the Norwegian aviator Capt. Sem-Jacobsen, being up for 2½ hours and flying over Lillehammer, Randtford, &c.

German Flyer Sentenced in Russia.

AFTER awaiting trial since he landed at Warsaw, while attempting to make a record non-stop flight, on February 8th, the German pilot Mishewsky was last week sentenced to three months' imprisonment in a fortress for flying over fortified places without permission. The charge of espionage against him was dismissed.

Climbing Tests with Farmans.

SOME very good results have been obtained recently with some H. Farman biplanes of the latest type during tests by the Russian Government at St. Petersburg. Carrying a load and fitted with a 100 h.p. Gnome motor, one of the machines climbed 500 metres in 3 mins., 1,000 metres in 7 mins., 2,000 metres in 18 mins., and 2,800 metres in 25 mins.

Another Record by the Sikorsky Biplane.

IT is reported from St. Petersburg that on the 6th inst. the giant Sikorsky biplane "Ilya Mourametz" carried ten passengers to a height of 1,560 metres.

Fast Flying in Germany.

IN a steel Jeannin monoplane Lieut. Hesse and Capt. Fiegel are said to have flown from Hanover to Johannisthal, a distance of 300 kiloms., in one hour on the 6th inst. The following day Capt. Hahnelt and Lieut. Geyerion an Aviatik biplane went from Dresden to Johannisthal, a distance of 200 kiloms., in an hour and a half.



MONACO HYDRO-AEROPLANE MEETING.—A general view of the bay. On the landing stage are seen the two Morane-Saulniers of MM. Garros and Brindejonc de Moulinais, and on the water are a couple of other competitors, whilst the Foudre is seen at the quay on the right.

THE MONACO RALLY.

IN our last issue the progress of the various competitors in the Monaco Rally were chronicled up to Monday of last week. On the following morning Moineau started on his Breguet from Marseilles to complete the trip to Monaco, but in coming down at Tamaris his machine struck a buoy and had to be towed ashore by a torpedo boat. Fortunately the pilot and passenger escaped with nothing worse than a wetting. After being delayed by the weather at Albi, near Bordeaux for five days, Mallard attempted to complete his journey and reached Marseilles. On the 8th inst. Brindejone des Moulinais, who had returned from Genoa by rail the previous evening, set out to make a fresh attempt, this time over the Vienna route. On reaching Antibes, however, the machine capsized and was smashed, but the pilot escaped uninjured.

The French Eliminating trials for the Schneider Cup were held during the day and Dr. Espanet on his Nieuport, who was the only one to complete the four laps of the 10 kilom. course, which he did in 23 mins. 50½ secs., was awarded the first place. Levasseur on a Nieuport who completed two rounds was given the second place, while Garros on a Morane who did one lap was placed third. Prevost on a Deperdussin, Janoir, also on a Deperdussin and Brindejone on a Morane did not complete the course, but were classed as reserves.

On the following morning Verrier made a fresh start over the Buc-Monaco course while Renaux, likewise on a Farman, also started from Buc. After flying for about 80 kiloms., however, both pilots found the wind too strong for their liking and decided to return. Mallard started from Marseilles but had only completed about 20 kiloms. when he was in trouble with his motor and was towed into Cassis by a torpedo boat. Friday was a blank day but there was a good deal of activity on Saturday. Garros went on from Orange, where he had been delayed since the 2nd inst., and reached Marseilles. E. Stoeffler on an Aviatik started from Gotha and although his progress was retarded by a contrary wind he completed the stages to Frankfurt and Dijon. Later he was in trouble with his motor and had to come down at Villeneuve-les-Avignon. Legagneux started

from Brussels but after flying for an hour returned on account of the wind. Lord Carbery and Molla set out from Buc, but deemed it wise to go back owing to fog. Sunday morning saw Garros complete his trip from Brussels, and on reaching Monaco he immediately set out to make another attempt, this time over the Monaco-Buc course. Verrier on an H. Farman, Renaux on a M. Farman and Molla on an R.E.P. left Buc followed by Lord Carbery on a Morane and all four reached Angers safely. Verrier went on to Bordeaux and then had to stop at Albi for petrol, while, when making an enforced landing on the Arnet Plain near Pezenas, the machine collided with a tree and was damaged. Renaux had to stop at Gemozac owing to ignition troubles. Molla reached Bordeaux but Lord Carbery gave up at Angers. Legagneux started from Brussels but had to come down at Ypres owing to motor trouble. On Monday, Garros made a splendid flight from Marseilles and as his official flying time for the full course from Monaco to Buc—12 hrs. 11 mins. 34½ secs. was nearly 3½ hours better than Brindejone's time he secured the leading place in the competition. Moineau made a fresh start from Buc and reached Bordeaux safely after the regulation stops at Angers. Bertin also started from Buc but was soon in trouble. Renaux went on from Gemozac to Bordeaux.

Tuesday saw another fine effort by Garros which eventually secured him the second prize. Starting from Brussels again he made his way by Calais and Dijon to Marseilles. Renaux went on to Marseilles and afterwards to Monaco. Mallard, having had his machine repaired also reached Monaco, while Verrier got as far as Marseilles. On Wednesday morning Garros finished at Monaco, as also did Verrier. It was announced later in the day that provisionally Garros had been awarded the prizes for the best and second best times, followed by Brindejone des Moulinais, Renaux, Verrier and Mallard. The best aggregate times were:—Garros (Monaco to Buc) 12 hrs. 14 mins. 21 secs., Garros (Brussels to Monaco) 12 hrs. 27 mins. 13 secs., Brindejone des Moulinais (Madrid to Monaco) 16 hrs. 2 mins. 31½ secs.

CORRESPONDENCE.

Wood in Aircraft.

[1852] A careful observation of all the aeroplanes at the Aero Show at the Olympia, and conversation with some of the practical men responsible for the building of them, has suggested to me one or two points which I think aeroplane builders might do well to consider, both for the better security of life, and also for economy.

The first is: Has it ever occurred to the aeroplane builder that the timber in one of these craft may possibly become "dead," i.e., lose its life and strength in a very much shorter period—indeed, in a period which has never been considered possible previously—as the result of exposure to climatic change, and the intense speed at which it is driven through the air?

There is a great similarity between the physical conditions of animal life and vegetable life. Timber, like the human being, is affected by climatic conditions, and is capable of being worn out even as human nature is. Scientists have told us that the edge of a razor becomes tired—the temper of the steel is worn out. I am inclined to think that the explanation of a great many breakages to timber in aeroplanes may be attributed to this cause. If fresh timber be stowed in a confined place, as for instance, the hold of a hot ship, fermentation takes place and fungus or disease may be started. After being sawn up, if it is not well protected, decay readily sets in. Thoroughly seasoned timber placed in a damp atmosphere will absorb the damp around it and expand. Timber placed in the heat of the sun will crack sometimes with a report like the firing of a gun, and exposed to extreme frost somewhat similar results may be expected.

All these points go to show how easily timber is affected by climatic conditions.

The human being suffers from fatigue after driving through the air at tremendous speed, and I am inclined to think that the timber suffers from exactly the same fatigue without the recuperative power which the human being possesses.

If my theory is correct, therefore, the timber in aeroplanes ought to be changed much more frequently than has been thought necessary up to the present.

I should suggest the following rules to be observed with the object of making the aeroplane as safe as it may be possible:—

1. After three months' use, a careful inspection should be made of every part of the timber which is used in the construction of the machine, and if it be found that any portion shows any sign of loss of strength, that portion to be replaced.

2. That a committee should be formed of a few leading men engaged in the supply of the material used in the building of the

machines, who should have before them a report from every flyer who has experienced the breakage of any particular part where timber is used.

3. The kind of timber and the conditions under which it was used, and the way in which it broke should be registered, so that a careful scientific record could be kept from which the future building might be controlled, and so that this might not be only theory but also practice, I shall be glad to offer myself to serve upon any such committee in case it may be formed.

ALEXANDER L. HOWARD.

40, Trinity Square, E.C.

The "Britannia," not the "I.C.S."

[1853] Knowing the reputation FLIGHT has for accuracy, will you kindly permit me to make a correction in the paragraph on page 368 of April 4th? I see it is stated that Mr. J. J. Hammond writes from New Zealand that he is flying the Government I.C.S. Blériot. If by the initials I.C.S. the International Correspondence School is indicated, I have no knowledge of any aeroplane being sent out by that body to New Zealand, and feel sure that Mr. J. J. Hammond means the aeroplane which was presented to the New Zealand Government by the Imperial Air Fleet Committee. The idea originated from our Chairman, Mr. Alfred Docker, and the Chairman of the Executive Committee was our Managing Director, Mr. William Coward, F.R.G.S., and this firm, in conjunction with the *Standard*, guaranteed the purchase money for the "Britannia." We have just received from Mr. T. W. Wilson, Town Clerk, Auckland, an illustration from the *New Zealand Herald*, wherein Mr. J. J. Hammond is shown flying the aeroplane "Britannia," which was christened by Lady Desborough, and presented to the New Zealand Government at Hendon last May.

pro WILLIAM COWARD AND CO., LTD.,

A. M. SCOTT, Secretary.

100, Bishopsgate, E.C., April 4th.

Memorial to Major Hewetson.

GENERAL SIR HORACE SMITH-DORRIEN, Commander-in-Chief Southern Command, on Tuesday unveiled a Celtic cross which has been erected at the south-east corner of Fargo Wood on Salisbury Plain, as a memorial to Major A. W. Hewetson, R.F.A., who was killed while flying on July 17th, 1913. In the course of a short address, General Smith-Dorrien said that the R.F.C. was a branch of the Services which differed from any other, as its members were constantly on active service.

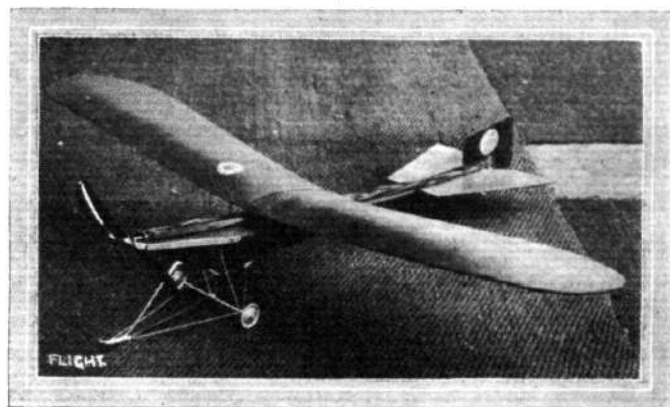
Models

Edited by V. E. JOHNSON, M.A.

Some Suggestions for this Season's Competitions.

HAVING been asked from several quarters to publish some suggested competitions for the consideration of our readers, we have much pleasure in submitting the following. We shall also be very pleased to publish any proposed by our readers, more especially if they are on novel lines and likely to give results of practical value:—

1. For all competitions all r.o.g. models should really rise off the ground and not off a board, strip of linoleum, &c. The ground could of course be prepared, *i.e.*, if grass, cut and rolled, and if bare earth it could, if uneven, be rolled.
2. In all first-class competitions, but excluding those of a purely sporting character such as inter-club competitions, the length of the model should not exceed the span.
3. In the case of tractors, the fuselage should contain at least three longitudinals.
4. That the minimum weight for hydro-aeroplanes be one pound if with twin propellers, and 8 ozs. if with one propeller only. Models with twin propellers under a pound in weight don't hydro-



Mr. H. R. Weston's weight-carrying model.

plane at all in the true sense of the word. Against anything in the nature of a breeze they, practically speaking, just jump off the water.

5. That some competitions be arranged with canard-type models (preferably large), fitted with covered-in fuselages, in order to test practically the effect of such on the stability factors of this type of model.
6. That competitions be held for variable speed machines. The winner to be the machine showing the greatest range of speed. It does not of course follow that the *slowest* or the *fastest* machine would win.
7. That a competition be arranged for machines of the (—) type; possessing no separate tail or elevator like the Dunne.
8. That in all the above, or in any other suggested competitions, every model be first examined by the judges, and so many marks allotted for design and construction; that in every case a qualifying duration be made; and that in certain cases so many marks be allotted for the climbing abilities exhibited by the model. That whenever possible all models be submitted to a steering test.
9. In the case of hydro-aeroplanes, the models should demonstrate their ability to run along the water without rising, minimum run 50 yds., all planes, &c., attached. Taxi-ing test: The lifting surfaces to be removed, and the model to make a run along the surface as a hydroplane only; the rubber motor to be fully wound up. Hydroplaning test: All the models to be immersed (totally) so far as their floats are concerned for a certain period to test the watertightness of the floats.
10. That the present system so much in vogue of running through all competitions in a single day could in certain cases be abandoned with benefit.
11. That, if the matter can be arranged, a prize be

offered for a model aeroplane controlled or even steered laterally in the first instance by "wireless." The prize will not probably be won this year, but it might; in any case, it is only a question of time. There are many more suggestions that could be given, but enough has been said to open up the subject for discussion.

"The Moonlight Suicides at Littlestone."

Mr. L. F. Hutcheon sends us the following experience of moonlight flights:—

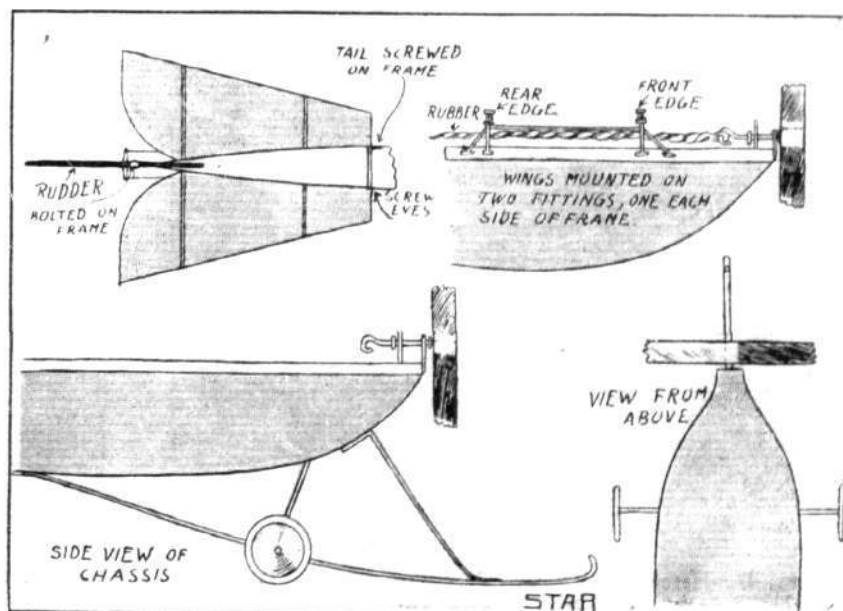
"I was much interested in your communication from Mr. Bruce Herd, of the Littlestone Model Aero Club, on 'Extraordinary Moonlight Flights.' Several times recently, between 9 and 10 p.m., I have watched the flights of a large tractor monoplane built by L. G. Tucker and A. G. Boniface, of the Wimbledon and District Aero Club. They took place in a large flat field bounded by trees, and the results obtained have been better in many respects than those of the same machine in daytime on Wimbledon Common, this being due, in our opinion, to the air being more still. A tractor is a much more sensitive machine than the twin-screw canards used by the Littlestone members, so that we should not have failed to detect any variations in the performance due to abnormal atmospheric conditions. Tucker and I have many times during the past three years flown models (both tractors and canards) fitted with flares and 'sparklers' on Wimbledon Common at night, but we have never noticed any appreciable difference in the results. Mr. A. F. Houlberg told me some time ago that his models made better durations in sunshine than on a dull day, but I know no reason of either sunshine or moonshine that would account for four models committing suicide in one evening."

Personally, the writer has never flown a model by moonlight or, indeed, at night at all, but he has always been given to understand that they did not fly so well at night. *Re* sunshine and dull weather, we should certainly corroborate Mr. Houlberg's statement.

Mr. H. R. Weston's Weight-Carrying Tractor.

The following description and drawings have been kindly supplied us by Mr. Weston, of the Star Aeroplane Co:—

"The machine was built for the weight-lifting competition, and is of the 'tractor' monoplane type. Weight complete, 20½ oz., and with the loading on 26½ oz. The main plane is of 'Blériot' design, only cambered after the manner of the 'Handley Page'; that is, a gradually lessening camber towards the tips and very high in the centre. It is double-surfaced, and on the underside is a slight inverted camber on the leading edge, after the manner of full-size design. The span is 5 ft. by 10 ins. chord. A particular feature is that the main plane is upraised a little from the frame, and the rubber is allowed to run under it. The fuselage is 3 ft. 6 ins. long, and is of the three-spar streamlined type, only this has also a length of strong magnalium tubing running the length of frame to take



the twist of the rubber motor. The tail plane is 14 ins. span and 12 ins. long, and is covered in two pieces, with a gap in the centre the shape of the body, so that the tail does not lie on top of plane, but gives the appearance of being built on to the body. The rudder is of 'Blériot' design, only with an exaggerated length, viz. 9 ins. by 5 ins. The rudder is made of 18 g. and 20 g. piano wire, and is movable either to right or left. The chassis is made of umbrella ribbing and 18 g. wire, and is absolutely unbreakable, fitted with a cane skid, and at the extreme end a piece of rubber joins it, and curls up with it, making the strength very great. This chassis is of very novel design, and quite original. The model is covered both sides throughout (also the body being covered in) with 'Star' red silk fabric. It is fitted with a very strong bevel gear, and a 14-in. Star curved tractor, driven by 28 strands $\frac{1}{4}$ -in. rubber, i.e., 14 strands to each gear wheel. This model has a really wonderful gliding angle, and tested from a height of 12 ft. from ground, we found her gliding angle to be roughly 1 in 29, and its powers of recovery are very great, it being held sometimes at a very steep angle to the ground, always recovering and landing gracefully."

The Broadstairs Model Construction Co.

We have received from the above firm one of their 8s. 6d. "Tractor planes." The firm state that it has been their endeavour to place upon the market a machine which might safely be called "fool proof." Whether any model tractor could be really made fool proof we rather doubt; but the machine in question goes a very long way in that direction. It is certainly very easy to fly. The machine is unquestionably good value for the money. It is of the r.o.g. type, and the chassis can be folded up, in a very simple manner, by slipping it out of the sockets on the body, when the skids can be detached and sprung flat; when erected it is quite strong. The makers state this to be their own idea, and we have certainly not seen a chassis on similar lines; at first we must confess we were not altogether favourably impressed by the wire, which scarcely appeared strong enough to protect the propeller. This opinion was wrong, however; because after having submitted the model to some quite severe tests without breaking it in any way, we handed it over to a juvenile member of the family, who promptly took to flying it in a garden, enclosed by two stout and high fences and numerous trees. The collisions were frequent, and the tumbles and nose-dives terrible, owing to our young friend flying

it without the tail fin, which had to be fished up from the adjoining garden. At present the model is absolutely unbroken, and it is certainly not for want of trying. The adjustment for elevation is by moving the main plane along the fuselage, from which it can be instantly removed or replaced when desired. The length of the machine is 2 ft. 6 ins., the span 2 ft. and the propeller diameter 8 ins. The wheels, disc and rubber tyred, are 2 ins. in diameter. A small improvement we should suggest is a little wheel instead of the rear skid, which would considerably facilitate rising off ordinary ground.

Anglo-American Exhibition at Shepherd's Bush.

Efforts are being made to arrange a section for aeronautical models and model motor boats at the above exhibition, which will be open from May until October. It is also proposed to run competitions in connection with the same, on one of the lakes and in the Stadium.

Aeromodellists or motor boat runners who have any thoughts of exhibiting should at once communicate with the Aviation Secretary of the Anglo-American Exposition, Administration Buildings, Shepherd's Bush, W. Further particulars will be given later.

Replies in Brief.

F. COOPER.—Try moving your main plane further back; if this does not do it, try decreasing its angle of incidence. You could probably use a 12-inch propeller with advantage.

The Model Editor desires to thank the following for particulars, drawings, photos, &c., of their models exhibited at Olympia, which will appear in due course, viz., Messrs. F. G. Carter, P. G. Cox, J. J. Holt, F. W. Jannaway, S. Kitchenham, W. Jones, W. Key, W. H. Norton, C. L. Pratt, D. Stanger, L. S. Wyatt.



AFFILIATED MODEL CLUBS DIARY.

CLUB reports of chief work done will be published monthly for the future. Secretaries' reports, to be included, must reach the Editor on the last Monday in each month.

Leytonstone and District Aero Club (64, LEYSPRING ROAD).

APRIL 19TH, flying on Wanstead Flats at 6.30 and 10 a.m.

Paddington and Districts (77, SWINDERBY ROAD, WEMBLEY).

APRIL 18TH, flying at Sudbury. Twin-screw handicap, 6-cz. weight, 4-cz. loading, average of three flights. Two prizes.

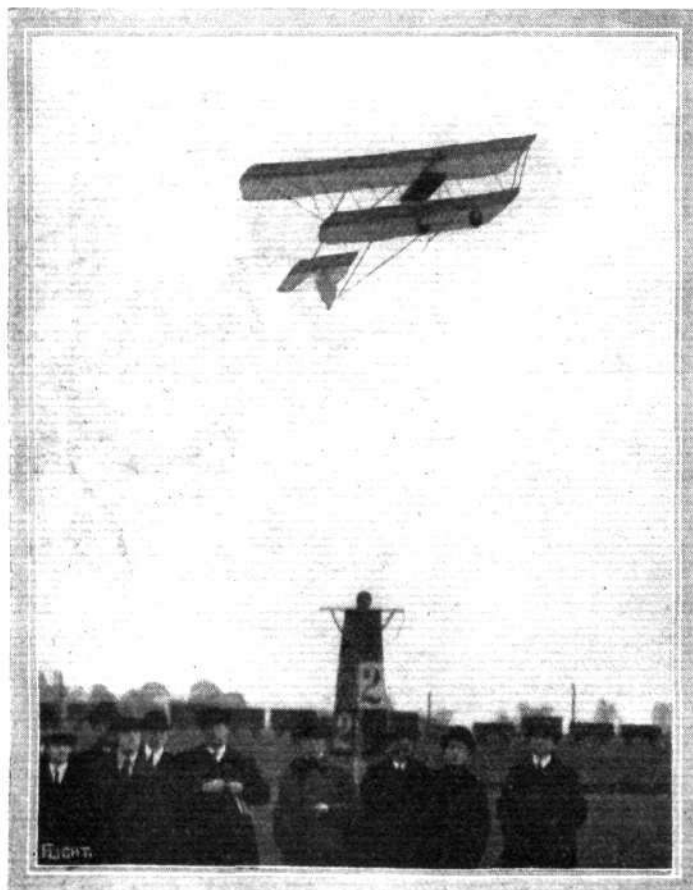
UNAFFILIATED CLUBS.

Finsbury Park and District (52, LAMBTON RD., STROUD GREEN).

APRIL 18TH, flying at Finsbury Park (Kite Ground), 3 p.m. till 6 p.m.

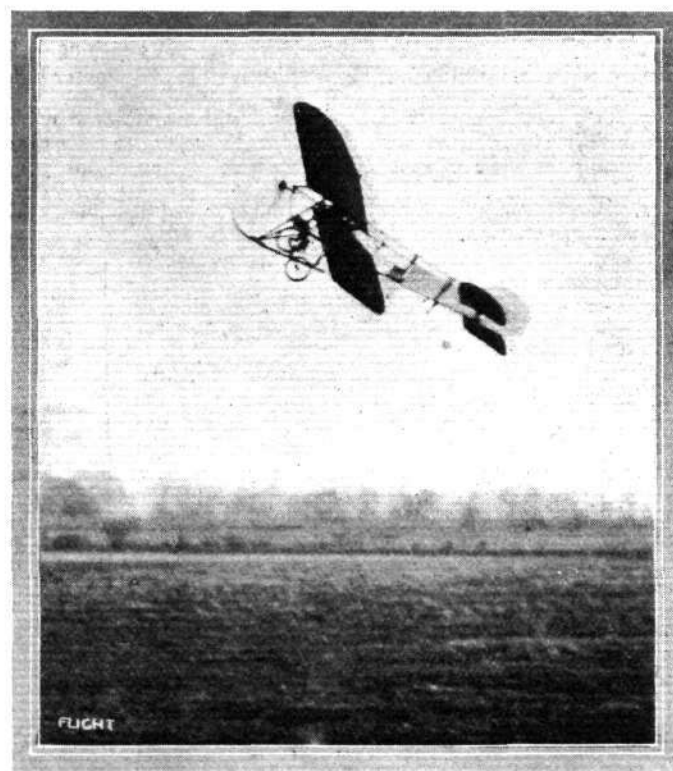
S. Eastern Model Ae.C. (1, RAILWAY APPROACH, BROCKLEY).

WEEK-END flying at Blackheath and Lee as usual.



"Flight" Copyright.

Messrs. D. Hiscox's and C. Desoutter's Olympia model climbing at Hendon.



"Flight" Copyright.

Mr. D. Stanger's Olympia petrol-driven tractor flying at Hendon.

INTERNATIONAL AERO EXHIBITION MODEL TRIALS.

THE Model Flying Trials in connection with the Olympia Exhibition took place at the London Aerodrome by permission of the Grahame-White Aviation Co., Ltd., on April 3rd and April 4th, the hydro-aeroplanes being tested on the afternoon of April 4th on the Welsh Harp water. A sum of £50 in prizes had been provided by the Royal Aero Club, and the trials were carried out by the Kite and Model Aeroplane Association.

The thanks of the Association are due to the following gentlemen who kindly acted as judges, viz.: Sir John Shelley, Bt., Sir Bryan Leighton, Dr. A. P. Thurston, A.F.A.S., Lieut. T. O'B. Hubbard, Prof. J. Morris, Major Baden-Powell, Messrs. R. M. Balston, B. C. Cooper, A.F.A.S., and J. H. Ledeboer, A.F.A.S.

The following are the results:—

CLASS 2A.—Twin-screw r.o.g. 8-oz. Models.

1st prize, £5; 2nd, £3; 3rd, £1.

| | | Marks. | | | |
|--------|-----|--------------------|--------------------------|------------|-----------|
| Place. | No. | Name. | Design and Construction. | Stability. | Duration. |
| 1 | 52 | G. Hayden | 53 | 52 | 113 |
| 1 | 169 | A. F. Houlberg | 63 | 65 | 90 |
| 3 | 175 | F. W. Powell | 58 | 53 | 89 |
| 4 | 95 | H. G. Bond | 58 | 63 | 77 |
| 5 | 71 | L. H. Slatter | 63 | 60 | 71 |
| 6 | 1 | C. Claffin | 53 | 57 | 71 |
| 7 | 117 | J. Louch | 51 | 51 | 74 |
| 8 | 12 | R. L. Rogers | 54 | 45 | 67 |
| 9 | 111 | W. Hersom | 48 | 47 | 64 |
| 10 | 139 | D. Driver | 52 | 45 | 61 |
| 11 | 56 | Howkins and Ingram | 50 | 50 | 55 |
| 12 | 152 | W. Key | 66 | 45 | 42 |
| 13 | 137 | T. Carter | 53 | 46 | 52 |
| 14 | 48 | H. Hervey | 41 | 45 | 64 |
| 15 | 105 | F. Hawthorn | 49 | 50 | 51 |
| 16 | 107 | G. Hawthorn | 51 | 47 | 51 |
| 17 | 109 | S. Hersom | 52 | 33 | 59 |
| 18 | 136 | R. Bird | 45 | 50 | 49 |
| 19 | 125 | F. Wood | 50 | 45 | 44 |
| 20 | 183 | E. Dowsett | 47 | 35 | 53 |
| 21 | 166 | T. D. C. Chown | 48 | 40 | 45 |
| 22 | 171 | D. Laing | 56 | 45 | 31 |
| 23 | 158 | M. H. Wilson | 65 | 43 | 24 |
| 24 | 159 | R. G. Wilson | 64 | 40 | 28 |
| 25 | 7 | J. McBurnie | 66 | 25 | 33 |
| 26 | 100 | F. Grattan | 53 | 35 | 31 |
| 27 | 76 | S. T. Smith | 57 | 40 | 19 |
| 28 | 130 | W. A. Dore | 54 | 35 | 25 |
| 29 | 115 | T. Kimpton | 46 | 33 | 34 |
| 30 | 120 | B. Ludlow | 52 | 30 | 23 |
| 31 | 142 | W. Evans | 51 | 25 | 24 |
| 32 | 177 | F. Wilkinson | 49 | 25 | 26 |
| 33 | 11 | A. Rogers | 51 | 25 | 20 |
| 34 | 75 | V. Smith | 51 | 30 | 14 |
| 35 | 151 | J. Hoyle | 46 | 25 | 17 |
| 36 | 38 | P. Cox | 46 | 25 | 10 |
| 37 | 147 | H. R. Weston | 46 | 20 | 14 |
| 38 | 159 | J. Sutton | 54 | 10 | 6 |

This class resulted in a tie, with 218 marks for first place. Therefore 1st and 2nd prize is divided between Messrs. Hayden and Houlberg.

CLASS 2B.—6-oz. Single-screw r.o.g.

1st prize, £2; 2nd, £1.

| Place. | No. | Name. | Design and Construction. | Stability. | Duration. | Total. |
|--------|-----|----------------|--------------------------|------------|-----------|--------|
| 1 | 86 | H. Weston | 77 | 75 | 55 | 207 |
| 2 | 165 | A. Boniface | 66½ | 75 | 45 | 186½ |
| 3 | 140 | D. Driver | 68½ | 70 | 47 | 185½ |
| 4 | 101 | F. Grattan | 78 | 50 | 42 | 170 |
| 5 | 167 | T. D. C. Chown | 68 | 57½ | 32 | 157½ |
| 6 | 53 | A. Houlberg | 84 | 59 | 20 | 153 |
| 7 | 146 | M. Levy | 57½ | 47 | 44 | 148½ |
| 8 | 14 | O. Root | 54½ | 57 | 29 | 140½ |
| 9 | 72 | L. Slatter | 80 | 35½ | 22 | 137½ |
| 10 | 143 | W. Evans | 73 | 20 | 10 | 103 |
| 11 | 3 | J. W. Dann | 56 | 26½ | 15½ | 98 |

CLASS 3.—Hydro-aeroplanes.

1st prize, £4; 2nd £3; 3rd, £1.

Two trials off water, one off land.

| Place. | No. | Name. | Design and Construction. | Stability. | Duration. | Total. |
|--------|-----|----------------|--------------------------|------------|-----------|--------|
| 1 | 73 | L. H. Slatter | 80 | 74 | 51 | 206 |
| 2 | 28 | J. Akers | 73 | 70 | 44 | 187 |
| 3 | 57 | F. Jannaway | 78 | 71 | 31 | 180 |
| 4 | 118 | J. Louch | 72 | 70 | 37 | 179 |
| 5 | 13 | R. Rogers | 72 | 65 | 34 | 171 |
| 6 | 23 | D. Paveley | 71 | 70 | 28 | 160 |
| 7 | 94 | H. Bedford | 70 | 66 | 30½ | 166½ |
| 8 | 216 | A. Houlberg | 83 | 65 | 17 | 165 |
| 9 | 33 | G. Brookes | 74 | 63 | 28 | 165 |
| 10 | 25 | — | 75 | 68 | 21 | 164 |
| 11 | 108 | G. Hawthorn | 76 | 60 | 18 | 154 |
| 12* | 85 | W. Williams | 52 | 65 | 36 | 153 |
| 13 | 134 | B. Longstaffe | 60 | 60 | 18 | 138 |
| 14* | 31 | G. Bragg-Smith | 65 | 61 | 11½ | 137½ |
| 15 | 112 | W. Hersom | 71 | 50 | 14 | 136 |

* Messrs. Williams and Bragg-Smith having no wheels lost their land trial as well as 25 design marks.

CLASS 5.—6-oz. Single-screw r.o.g. Tractors.

1st prize, £3; 2nd, £2; 3rd, £1.

| Place. | No. | Name. | Design and Construction. | Stability. | Duration. | Total. |
|--------|-----|--------------|--------------------------|------------|-----------|--------|
| 1 | 5 | F. Hindsley | 35 | 45 | 58 | 138 |
| 2 | 173 | D. Laing | 35½ | 43 | 34 | 112½ |
| 3 | 22 | D. Paveley | 37 | 40 | 33½ | 110½ |
| 4 | 128 | F. H. Burton | 34½ | 40 | 27 | 101½ |
| 5 | 54 | A. Houlberg | 42½ | 39 | 19½ | 101 |
| 6 | 180 | S. Camm | 40 | 35½ | 25 | 100½ |

CLASS 6.—Weight-carrying Models. Each carrying a deadweight of a quarter of its own weight; minimum unloaded, 16 ozs.

1st prize, £4; 2nd, £2.

| Place. | No. | Name. | Design and Construction. | Stability. | Duration. | Total. |
|--------|-----|-------------|--------------------------|------------|-----------|--------|
| 1 | 42 | D. Easdale | 66 | 81½ | 31 | 178½ |
| 2 | 74 | L. Slatter | 72 | 70 | 34 | 176 |
| 3 | 55 | A. Houlberg | 75 | 63 | 27 | 165 |
| 4 | 58 | F. Jannaway | 70 | 46½ | 19 | 135½ |
| 5 | 39 | P. Cox | 60 | 30 | 15 | 105 |

CLASS 7.—Models embodying New Design applicable to Full-size Machines.

Prize £3 awarded at the discretion of the judges for the model embodying the most original and practical idea.

This has been awarded to Exhibit No. 207 (W. H. Nosworthy), which, in the opinion of the judges, was the most original idea, viz., variable angle wings, independently operated with tail for lateral stability.

Team Competition in Class 2A. For Teams of Six Members from Affiliated Clubs.

Prizes presented by F. K. McClean, Esq., viz., silver medals to winners, bronze medals to runners up. The Association did not, in fairness to the clubs, compete.

Results of first five clubs:—

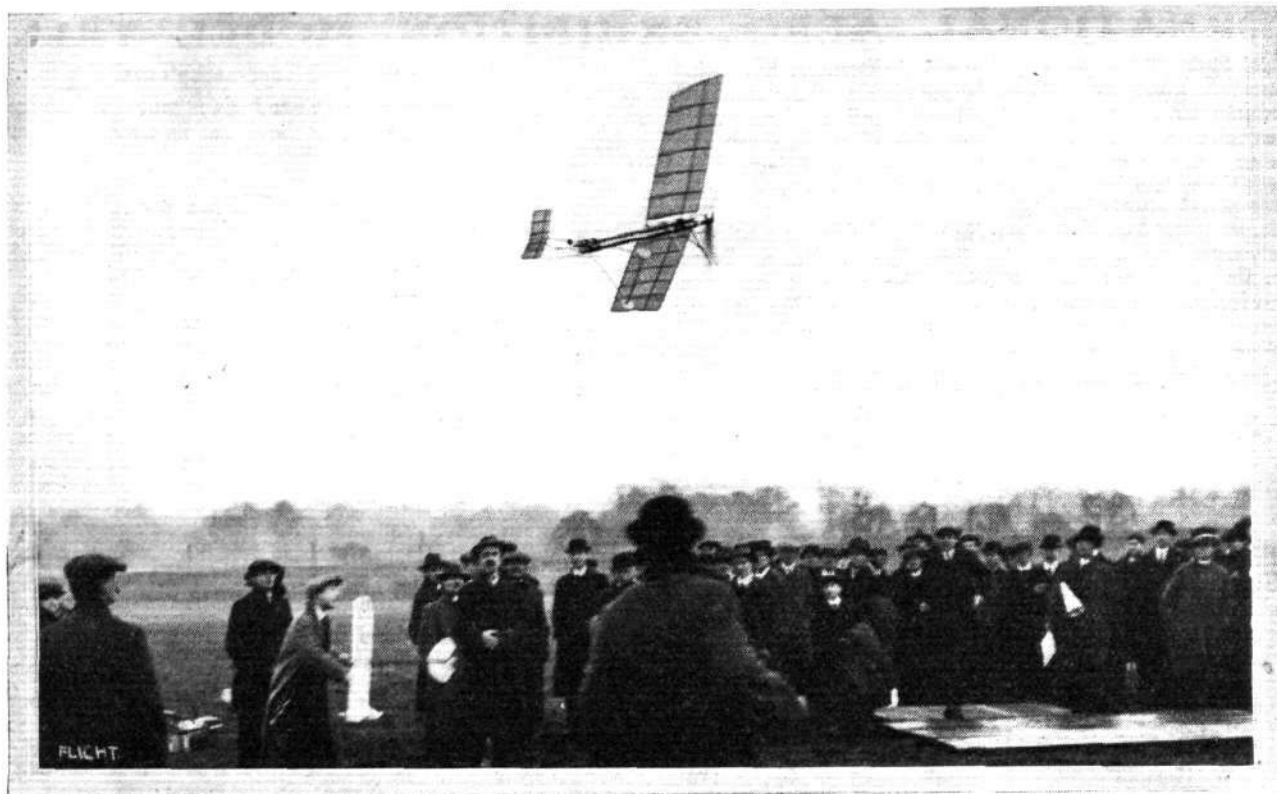
Wimbledon Team.—G. Hayden, 218 marks; A. Houlberg, 218; F. Powell, 200; L. H. Slatter, 194; T. D. C. Chown, 133; D. Laing, 132. Total, 1,095 marks.

Leytonstone Team.—H. Bond, 198 marks; J. Louch, 176; W. Hersom, 158; F. Hawthorn, 150; G. Hawthorn, 149; S. Hersom, 144. Total, 975 marks.

Paddington Team.—D. Driver, 158 marks; T. Carter, 151; R. Bird, 144; W. Evans, 100; H. R. Weston, 80. Total, 633 marks.

Reigate and Redhill Team.—W. Key, 153 marks; M. H. Wilson, 132; R. G. Wilson, 132; J. Hoyle, 88; W. H. Norton, 70. Total, 575 marks.

Aero Models Association Team.—C. Claffin, 181 marks; R. L. Rogers, 166; J. McBurnie, 124; A. Rogers, 95. Total, 566 marks.



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Messrs. T. W. K. Clarke and Co.'s compressed-air-driven Olympia model in flight at Hendon.

AERONAUTICAL SOCIETY OF GREAT BRITAIN.

Official Notices.

1. **Elections.**—Members: Christian H. Gray and Lieut. Baron Trevenen James, R.E. Student: Harold Grinstead.

2. **Meeting.**—The twelfth meeting of the present session will be held on Wednesday, May 6th, at 8.30 p.m., when Dr. A. P. Thurston will read a paper, to be followed by a discussion, on "The Measurement of Air Speed."

B. G. COOPER, Secretary.



THE BRISTOL IN PARIS.

FOLLOWING the great interest felt in aviation circles at the recent announcement that the licence for the construction of the Bristol aeroplanes, at the instigation of the French Government, had been granted to the well-known firm of French constructors, Messrs. Breguet, it will be still more interesting to record what was achieved by one of these British machines when it was put into actual commission. It has frequently been stated recently that British constructors have little or nothing to learn from their one time masters the French, and the summary given below of the actual achievements made by this machine in Paris during the past week or two go to confirm this. Under the pilotage of Mr. Sidney V. Sippe, the Bristol made flights which have not been approached by any machine either in France or anywhere else, whether biplane or monoplane, when the tests have been made with the same horsepower and loads. For example, we give the following official tests made with a Standard Bristol tractor biplane, fitted with an 80 h.p. Rhône motor:—

Climbing—3,280 ft. with useful load of 385 lbs. ... 5 mins. 10 secs.
also 3,280 " " 605 " ... 6 " 30 "
" 3,280 " " 715 " ... 7 " 35 "

Speed—Fast, 74½ miles per hour. Slow, 35 miles per hour.

All these tests were made under severe weather conditions and strictest official criticism, and it is a matter for congratulation to British construction generally that it performed everything not only satisfactorily but in such an emphatic manner. Not only did the machine in its tests show itself to be fit for any company except machines designed for one or two purposes alone, such as climbing machines of the freak nature, or machines designed to carry enormous loads only, but it has proved its exceptional all-round efficiency as a military machine. In view of the excellent construction of this particular machine, it is extraordinary that after these demonstrations of their aerodynamical qualities these machines are not in more general use in our own services.

NEW COMPANY REGISTERED.

Hewlett and Blondeau, Ltd., Omnia Works, Vardens Road, Clapham Junction, S.W.—Capital £10,000, in £1 shares (4,000 pref.). Acquiring the business carried on by Hilda B. Hewlett and G. Blondeau at Omnia Works, Vardens Road, Clapham Junction, S.W., as Hewlett and Blondeau, manufacturers of aeroplanes, hydroplanes, &c. First directors, Mrs. Hilda B. Hewlett and Gustave Blondeau.



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IMPORTS AND EXPORTS, 1913-1914.

AEROPLANES, airships, balloons, and parts thereof (not shown separately before 1910). For 1910 and 1911 figures, see FLIGHT, January 25th, 1912, and for 1912 and 1913, see FLIGHT for January 17th, 1914:—

| | Imports. | | Exports. | | Re-Exportation. | |
|-----------|----------|--------|----------|-------|-----------------|-------|
| | 1913. | 1914. | 1913. | 1914. | 1913. | 1914. |
| | £ | £ | £ | £ | £ | £ |
| January | 12,097 | 5,945 | 4,005 | 210 | 1,510 | 879 |
| February | 17,361 | 28,132 | 3,447 | 106 | 690 | 441 |
| March ... | 20,425 | 27,731 | 1,924 | 1,934 | 1,042 | 1,440 |
| | 49,883 | 61,808 | 9,376 | 2,250 | 3,242 | 2,760 |

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